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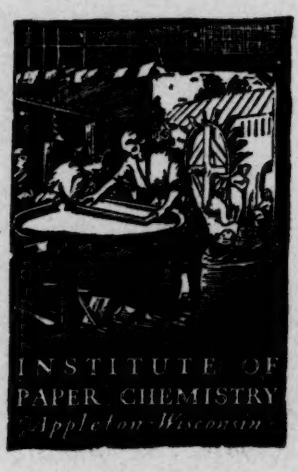
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

DECEMBER · 1951

Volume 22 Number 4

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THE INSTITUTE OF PAPER CHEMISTRY

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Books and Pamphlets Added to the Library During November

CHEMISTRY, PHYSICAL AND THEORETICAL

ANNUAL REVIEW of physical chemistry. G. K. Rollefson, editor; R. E. Powell, associate editor. Stanford, Annual Reviews, Inc., 1951. v. 2. 462 p.

CONTAINERS

MODERN PACKAGING encyclopedia, 1952. New York, Packaging Catalog Corp., c1951. 584 p.

The major emphasis in the paper-bound 1952 edition of the encyclopedia is placed on new developments and solutions to current packaging problems. Sections on packaging in a defense economy and military packaging are included, as well as a discussion of means for overcoming packaging shortages. Essential background information, which is covered in detail in former issues, is presented in condensed form, whereas the Buyers' Directory has been revised and expanded. A bibliography of references and source materials is included for the first time in this edition. The volume is supplied free to subscribers of *Modern Packaging.*

ECONOMIC CONDITIONS—YEARBOOKS

The ECONOMIC ALMANAC 1951-1952; a handbook of useful facts about business, labor and government in the United States and other areas. New York, The Conference Board, National Industrial Conference Board [c1951] 663 p.

FORESTS AND FORESTRY

BRAUN, E. LUCY. Deciduous forests of eastern North America. Philadelphia, The Blakiston Co., 1950. 596 p.

MATERIALS—DETERIORATION

SIU, R. G. H. Microbial decomposition of cellulose, with special reference to cotton textiles. New York, Reinhold, 1951. 531 p.

MICRO-ORGANISMS

ANNUAL REVIEW of microbiology. Charles E. Clifton, editor; Sidney Raffel and H. Albert Barker, associate editors. Stanford, Annual Reviews, Inc., 1951. v. 5. 379 p.

MONEY

ROBERTSON, D. H. Money, with an introduction by C. W. Guillebaud. [6th ed. rev. with add. chapters] Cambridge economic handbook II. New York, Pitman Publ. Corp. [1948] 223 p.

PAPER MAKING AND TRADE

COSTA COLL, T. Manual del fabricante de papel. Barcelona, Bosch, Casa Editorial [1946] 683 p.

JOINT EXECUTIVE COMMITTEE ON VOCATIONAL EDUCATION REPRESENTING THE PULP AND PAPER INDUSTRY OF THE UNITED STATES AND CANADA. Pulp and paper manufacture. v. 2. Preparation of stock for paper making. J. Newell Stephenson, editor-in-chief. New York, McGraw-Hill Book Co., 1951. 587 p.

The PULP and paper industry in the USA; a report by a mission of European experts. Paris, Organisation for European Economic Co-operation, 1951. 378 p.

PAPER MAKING AND TRADE—DICTIONARIES

RETTORI, A. Composition des sortes de papiers les plus employées. [Compiègne, L'Imprimerie de Compiègne] 1950. 189 p. + 17 plates.

PLASTIC MATERIALS

MODERN PLASTICS encyclopedia and engineer's handbook, 1951. New York, Plastics Catalogue Corp., 1951. 636 p.

In this 1951 edition, all the standard reference information which is contained in previous volumes has been omitted, and only new developments from the past year are treated in detail. A section on plastics in defense includes information on the use of plastics by various government departments, and additional sections cover machinery and equipment, engineering and methods, materials, and technical data. The directory section has been expanded in all departments and includes, for the first time, a section on reinforced plastics. The volume itself is much smaller than previous volumes and is paper-bound; it is supplied free to subscribers of *Modern Plastics*.

PUNCHED CARD SYSTEM

CASEY, ROBERT S., and PERRY, JAMES W., ed. Punched cards, their applications to science and industry. New York, Reinhold, 1951. 506 p.

SIZING (TEXTILE)

BEAN, PERCY, and SCARISBRICK, F. The chemistry and practice of sizing; a practical treatise on the sizing of cotton yarns, practical size mixing, tape sizing, ball or warp sizing, and hank sizing. . . 10th ed. Manchester, Hutton, Hartley & Co., 1921. 759 + xviii p.

TANNING

TANNERS' COUNCIL OF AMERICA. Reports and papers of the Research Laboratory of the Tanners' Council of America, Inc. at the University of Cincinnati, 1924-1949. New York, The Council [c1951] 6 v. 2765 p.

TRADE DIRECTORIES

CHEMICAL ENGINEERING CATALOG, 1951-52. 36th ed. New York, Reinhold, c1951. 1797 p.

LOCKWOOD'S directory of the paper and allied trades. 77th ed., 1952. New York, Lockwood Trade Journal Co., Inc., c1951. 1503 p.

WATER

AMERICAN WATER WORKS ASSOCIATION. Water quality and treatment, a manual. 2d ed. New York, The Association, 1950. 451 p.

VOM WASSER. Ein Jahrbuch für Wasserchemie und Wasserreinigungstechnik. Herausgegeben von der Fachgruppe Wasserchemie in der Gesellschaft Deutscher Chemiker. Verantwortlich für den Text: Wilhelm Husmann. 18. Band 1950/51. Weinheim, Verlag Chemie [c1951] 430 p.

WOOD

CANADA. *Dept. of the Interior. Forestry Branch. Forest Products Laboratories Division.* Canadian woods, their properties and uses. [2d ed. Ottawa, Edmond Cloutier, King's Printer, 1951] 367 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ABSORPTION SPECTRA

KEUSZLER, V. v., MECKE, R., and SIPPEL, A. The ultraviolet absorption spectra of commercial cellulose acetate. Makromol. Chem. 7, no. 1: 62-9 (July, 1951). [In German; English summary]

The ultraviolet absorption spectra of fractionated cellulose acetate of varying D.P.'s were measured. In the region between 3000 and 3700 A., the absorption coefficients were found to be nearly linear to the wavelength of the light absorbed. The change of the absorption coefficient as the wavelength increases is approximately the same for different D.P.'s. 5 tables, 3 figures, and 7 references. M.W.

ACID PLANT

MASAHIRO, Y., and KAZUO, K. Design of a sulfite acid tower. J. Japan. Tech. Assoc. Pulp Paper Ind. 5, no. 5: 412-16, 447 (October, 1951). [In Japanese; English summary]

In the determination of the height of a packed sulfite acid tower, the H.T.U. (height of one transfer unit) is computed by the use of Fujita's equation (*cf.* Chem. Machinery [Tokyo] 11: 11, 36 [1947]): $(\text{H.T.U.})_{OL} = \varphi Z^{0.2}[0.127(mG_M/L_M)^{-0.28} + 0.0533(mG_M/L_M)^{-1.30}]$. The authors have arrived at their own value for the equivalent stripping coefficient φ. Suggestions are given for the specification of minimum and maximum tower diameters. A sample calculation is included. 3 tables and 9 references. E.G.S.

ADHESIVES

[KOTTE, HANS] Seam adhesives for multiwall bags. Allg. Papier-Rundschau no. 17: 743 (Sept. 12, 1951). [In German] *cf.* B.I.P.C. 21: 833.

The article is based on the discussion by K. M. Shold. E.S.

MCLAREN, A. D., LI, T. T., RAGER, ROBERT, and MARK, H. Adhesion. IV. The meaning of tack temperature. J. Polymer Sci. 7, no. 5: 463-71 (November, 1951). [French and German summaries] *cf.* B.I.P.C. 19: 610.

It has been demonstrated that the adhesion of high polymers to cellulose is a function of tack temperatures and dielectric constants of the polymers and of dipole moments of polar groups in polymers. Tack temperature has been defined as the lowest temperature at which two films of polymer in contact with one another will just fuse under a pressure of 20 p.s.i. applied for two seconds. It has been assumed that under the same experimental conditions all amorphous polymers have equal viscosities at their respective tack temperatures; further evidence in support of this theory is provided

by the authors with a number of polymers. As a nonequilibrium property characterizing high polymers, tack temperature belongs in a category with brittle points (that temperature at which the time interval required by the sample to undergo the necessary deformation is just equal to the time interval of the test method, so that the material breaks), second-order transition points, and softening temperatures (at which a given deformation is produced by a fixed stress, so that the material flows). 2 tables, 5 figures, and 9 references. E.S.

ALKALINE PROCESSES

JONES, F. L. Some aspects of cooking pulp for hot stock refining. Paper Trade J. 133, no. 19: 28-30 (Nov. 9, 1951).

The cooking procedure is described which is used by the St. Joe Paper Co. for high-yield, hot-stock refining. Chips in the ¼- to ½-in. screen classification are used, and direct steaming is employed. The digesters are brought to a full pressure of 98 p.s.i. in one hour and remain at full pressure for 45 minutes. A maximum temperature of 342°F. is reached. The pulp produced has a chlorine number of 13 to 15 and a TAPPI permanganate number of 43 to 46. With regard to strength characteristics, high-yield pulps show a more rapid initial Mullen development and a higher tear value at the point of maximum Mullen development than normal-yield pulps. The primary basis for hot-stock refining is increased pulp yield per unit of wood. 7 figures. M.W.

LUNDERVILLE, JOHN P. Hard cooking of northern woods. Tappi 34, no. 11: 84A, 86A (November, 1951).

The cooking of northern coniferous woods at the Red Rock kraft board mill in Ontario to a harder stock than previously produced with an additional gain in yield of 7% is described. To hold the screen rejects to a minimum, a low charge of active alkali, a gradual increase to maximum temperature, and the shortest possible time at maximum temperature are employed. The size of the chips has been reduced to half an inch, and attention is paid to uniformity in length. The present production of rejects is about 4% of the total pulp production; all rejects are refined and returned to the furnish. No significant improvement in machine operation resulted from these changes, but the economic gains are obvious. It is felt that no further gains can be made at Red Rock without modification of the existing plant to permit hot-stock refining. E.S.

MARONNE, R. A. Hints and hitches in production of grasspaper. Indian Pulp and Paper 6, no. 1: 45-7 (July, 1951).

The author suggests the use of pressure washing for brown stock, the use of automatic lime kilns, the recovery of carbon dioxide from flue gases with subsequent combination with slake to form a synthetic chalk which, in combination with a silicate, will provide a good filler, and the use of hydrogen sulfide to actively sulfidize the cooking liquor. M.W.

ALKALINE PROCESSES—FURNACES

KRISHNASWAMY, S. R. Soot cleaning as an adjunct to sustained availability of Tomlinson unit. Indian Pulp and Paper 6, no. 1: 36-8, 40-3 (July, 1951).

The effectiveness of manual cleaning and automatic cleaning methods for

the removal of boiler deposits on a Tomlinson unit is analyzed and compared. 2 tables and 6 figures. M.W.

ALUMINUM

HILL, T. M. Properties and uses of aluminum foil in packaging. Am. Paper Converter 25, no. 11: 14, 46, 48 (November, 1951).

The properties of aluminum foil, such as its high covering area per pound, impermeability to water vapor, and strength, which make it particularly applicable in the packaging field, are described. The effects on these properties of variations in thickness and of pinholes are discussed. 1 table. M.W.

ASSOCIATIONS

ANON. Technical Section's new headquarters. World's Paper Trade Rev. 136, no. 17: 1214, 1216 (Oct. 25, 1951); Paper-Maker (London) 122, no. 5: 312-13 (November, 1951).

Brief reference is made to the inauguration of the offices of the Technical Section of the British Paper and Board Makers' Association at St. Winifred's, October 19, 1951, following the destructive fire in November, 1949. The much larger part of the rebuilding of the accommodations of the British Paper and Board Industry Research Association will not be finished for several months. 2 illustrations in the first reference. E.S.

BAGASSE

NORTHERN REGIONAL RESEARCH LABORATORY, *Peoria, Ill.* Restyling byproducts will add new income. Food Eng. 23, no. 8: 144-5 (August, 1951).

A process has been developed for the profitable disposal of two primary sugar cane by-products, bagasse and blackstrap molasses. The pith and fiber of the bagasse are loosened and separated by a rotary screen. The pith is dried, mixed with blackstrap molasses, and sold as one of the components of animal feed, and the pith-free fiber is dried, baled, and sold to paper mills. The depithed fiber produces superior paperboard and is also useful in high-grade paper manufacture. As yet the process has been proved only on a laboratory pilot-plant scale, but plans are under way for a large pilot-plant installation at a sugar mill. 3 illustrations. M.W.

BARK

NEILSON, J. E. Progress in bark burning equipment for steam generation in paper mills. Proc. Tech. Sect., Can. Pulp Paper Assoc. 37: 151-3 (1951).

The possibilities of and present experience with spreader stokers for the burning of paper mill bark are discussed. 7 figures. E.S.

BARKERS AND BARKING

HOGAN, BILL. New, small log barking units. Wood 56, no. 11: 33 (November, 1951).

The operation of the MURCO Adams-Clark portable barker, which was developed in this country and is manufactured by the D. J. Murray Co., and of the Anderson pneumatic barker, which was developed in Sweden, is described. The MURCO Adams-Clark machine was designed for use on

pine pulpwood cut in 5-ft. lengths but is also used on 8-ft. lengths. The Anderson barker is used on logs of 8 ft. or longer. Both machines bark logs with very little wood loss. 2 illustrations. M.W.

BEATING

ANON. Stock preparation and beating. Wochbl. Papierfabr. 79, no. 10: 283-7 (May 31, 1951). [In German]

Following a discussion of the morphological structure of the cellulose fiber with particular reference to the hemicelluloses, the physical processes involved in the swelling of pulps in water, and the influence of the temperature of water and drying processes on the wettability and swelling characteristics of pulps, the two principal functions of stock preparation are outlined: the gentle separation of the individual fibers from their accompanying substances and the treatment proper of the individual fibers. In the gradual development of machinery for this purpose (defiberers, halfstuff hollanders, Wurster machines, kneaders, breaker beaters, kollergangs, jordans, pulpers, and refiners), the efforts for a change from batch to continuous operation with its inherent economic advantages and a mild treatment at the highest possible water dilution are notable. Reference is made to the special (stamping, kneading, rolling-friction, and squeezing) treatment which the fibers receive in the old, much-discussed kollergang at a consistency of 25 to 40%, whereby the separation is principally brought about by fiber-to-fiber friction. No other type of stock-preparation equipment has to date been able to duplicate this mild mode of operation, so that European practice, particularly in Scandinavia, has not yet discarded the old-fashioned kollergang, but still accepts its many other economic disadvantages. The kollergang is capable of changing hard pulps into soft, curled stocks; the treatment also results in a high filler retention. Stock preparation in the batch-type beaters, the continuous low-speed jordan, and in modern high-speed refiners is evaluated with particular reference to the effect of construction details, consistency, and rate of operation on the results, supplemented by schematic drawings. Emphasis is placed on the advantages and possibilities of the high-speed refiner which can be adjusted to different rates of operation; the effect of consistency is particularly noticeable in this case. In conclusion, it is pointed out that the S.-R. beating degrees only indicate the dewatering rate of a pulp; however, they are no criterion for its sheet-forming properties and the paper characteristics which are dependent upon sheet formation. 2 tables and 7 figures. E.S.

KANE, MORRIS W. Beating, tensile strength, specific surface, and optically bonded area of pulp. Tappi 34, no. 11: 503-6 (November, 1951).

Recently a theory was presented on the development of tensile strength during the beating of pulp (*cf.* B.I.P.C. 20: 305). This theory was based on a small amount of experimental data and a considerable number of assumptions. In applying this theory to the data, it was possible to arbitrarily choose five unknowns in an equation containing six. This raises the objection that the equation can be fitted to any curve similar to a tensile *vs.* beating-time curve. Since the theory was presented, an article by Ratliff (*cf.* B.I.P.C. 20: 8) has afforded a means of estimating, from experimental data, more of the above-mentioned unknowns. When the theory was applied to these data, no inconsistencies were observed. 3 tables, 6 figures, and 3 references. E.S.

WILLIAMSON, HARRY. Paper and paperboard making. XIX.

Beater operation studies. Part 4. Paper Ind. 33, no. 8: 923-5 (November, 1951); *cf.* B.I.P.C. 22: 162.

Continuing the previous study of work performed by five beaters on five separate furnishes, the present report contains five time-rate charts, one for each beater; tables and control charts showing the adjustment of time rate of work for each beater on each of the selected furnishes; and recommendations on when and in what proportion the broke beater may be dumped most safely. Their application to beater control to develop the same final freeness is explained, and it is again emphasized that it is the work done on the base furnish which is most important. Broke should always be dumped in conjunction with the least efficient beater and never with a fast-developing one. 5 tables and 9 diagrams. E.S.

BIOCHEMICAL TESTING

DOUDOROFF, P., ANDERSON, B. G., BURDICK, G. E., GALTSOFF, P. S., HART, W. B., PATRICK, R., STRONG, E. R., SURBER, E. W., and VAN HORN, W. M. Bio-assay methods for the evaluation of acute toxicity of industrial wastes to fish. Sewage Ind. Wastes 23, no. 11: 1380-97 (November, 1951).

Bio-assay procedures which are intended for use in industrial and other laboratories in evaluating the toxicity of wastes and other water pollutants to fish are described. The tests can be used to determine the presence and the degree of toxicity. Following the outline of the procedures, sections on the care and feeding of test animals, suggested experimental concentrations, and an example of the derivation of median-tolerance limits by straight-line graphical interpolation are appended. 3 tables, 1 figure, and 7 references. M.W.

BLEACHING—SULFATE

BISHOP, FRED W. Kraft pulp bleaching in four stages. Paper Trade J. 133, no. 18: 21-2 (Nov. 2, 1951); *cf.* B.I.P.C. 21: 149.

The operation of the bleach plant at Southland Paper Mills is described. Both semibleached and fully bleached pulps to be used in the manufacture of newsprint and paperboard are produced. M.W.

REID, D. M. Chlorine dioxide bleaching of kraft pulp. Pulp Paper Mag. Can. 52, no. 11: 110-12 (October, 1951).

The author reviews the four processes of manufacture of chlorine dioxide which currently receive attention: the Holst and Persson processes, a procedure by Day and Fenn involving a diaphragmless electrolytic cell, and the generation from sodium chlorite. The first three methods involve rather costly generation plants at the mill; where this is not warranted, the fourth process may be applicable, although at the present market prices of chlorite this method of generation is considerably more expensive than the others. The advantages claimed for pulp bleached with chlorine dioxide are discussed, as well as construction materials and methods of application, with particular reference to the great flexibility which is possible. 7 references. E.S.

BOARD

BRADBURY, JESSE C., and MCCULLOUGH, JOHN L. Characteristics of sheets made from pine groundwood-pine kraft combinations. Paper Trade J. 133, no. 18: 24, 26 (Nov. 2, 1951); Pulp

Paper Mag. Can. 52, no. 13: 110-11 (December, 1951); Paper Mill News 74, no. 52: 11, 19 (Dec. 29, 1951).

Sheets of an outside linerboard, 15 point, 52 lb./1000 sq. ft., which consisted of one ply of unbleached kraft and four plies of 60% kraft and 40% groundwood were compared with 15 point, 60 lb./1000 sq. ft. solid five-ply kraft board. Although the basis weight of the solid kraft sheet was 17.5% higher than that of the kraft-groundwood combination, the caliper of the heavier kraft increased only 3.5%. The bursting strength of the solid kraft sheet was 32% higher than that of the combination, yet the lower test liner was sufficiently strong to surpass minimum requirements as an outer layer in corrugated box containers. The groundwood-kraft combinations have improved scoring and bending properties over the solid kraft and, because of their added resiliency, they are easier to print. These qualities, in addition to cost advantages, recommend the use of kraft-groundwood combinations in cases where strength is not of first importance, e.g., in food containerboards. 2 tables. M.W.

BOARD—CONVERSION

AMERICAN BOX BOARD COMPANY, *Grand Rapids, Mich.* American Box Board's new plant. Fibre Containers 36, no. 10: 97-8 (October, 1951).

The physical features of a new container plant for the manufacture of corrugated and solid fiber shipping containers are described. The plant was recently completed at a cost of over $1 million. 2 illustrations. M.W.

BOARD, BOX

BRAKEWOOD, H. E. Printing quality requirements for folding paperboard. Southern Pulp Paper Manuf. 14, no. 11: 54-6, 58 (November, 1951); Fibre Containers 36, no. 12: 169-74 (December, 1951); Paper Mill News 75, no. 1: 12, 14, 16-17 (Jan. 5, 1952).

Consideration is given to the requirements of the grades of folding boxboard currently and commonly made in relationship to letterpress printing. The most outstanding characteristic to be striven for is uniformity of all physical and chemical properties which a sheet of board possesses, although it is realized that it cannot be fully achieved. In addition, caliper, basis weight, strength (particularly surface and internal bonding strength), finish (smoothness), moisture content, color, sizing and ink receptivity (drip test *vs.* wax test), and cleanliness are discussed as important requirements. E.S.

BOARD, MEDICATED

BEHR, E. A., and HUBERT, A. J., JR. Preservation of fiber insulating board with copper pentachlorophenate. Tappi 34, no. 11: 519-23 (November, 1951); *cf.* B.I.P.C. 19: 302.

Copper pentachlorophenate (I) presents certain advantages over other agents for the preservation of fiber insulating board. The variables affecting the retention of (I) were studied, and it was found that the most important ones were the order of the addition of chemicals and the pH of the pulp-slurry mixture, whereas the fiber source or method of pulping exerted little influence. Depending upon mill conditions, two methods of adding the copper compound to the pulp are available: internal, where the reactants are added directly to the pulp in the sizing box, and external, where (I) is formed in an external reaction vessel and added as a suspension to the pulp; either method will result in equally good retention. Drying conditions which ap-

proximate commercial practice in fiberboard manufacture do not reduce retention appreciably. 5 tables and 5 references. E.S.

BOARD MILLS

ANON. The backing of the new Rome Kraft Co. is substantial—men and companies. Southern Pulp Paper Manuf. 14, no. 11: 13-14 (November, 1951); Fibre Containers 36, no. 11: 112-13 (November, 1951).

Reference is made to the formation of the Rome Kraft Company by The Mead Corporation, Dayton, Ohio, and the Inland Container Corporation, Indianapolis, Ind., for the purpose of building a new kraft containerboard mill at Coosa, 12 miles east of Rome, Ga. The officers of the new company and a brief history of the parent companies are given, and the plans for the new board mill and its operation are outlined briefly. E.S.

ANON. Nissaströms Bruks och Kraft Aktiebolag. Svensk Papperstidn. 54, no. 19: 685-8 (Oct. 15, 1951). [In Swedish]

In connection with the inauguration of the new hydroelectric power plant built by the Swedish board mill, a history of the mill and a description of the new power station are presented. 7 illustrations. E.S.

PAPER MILL NEWS. Forest hardboard increases production making panel board. Paper Mill News 74, no. 46: 74 (Nov. 17, 1951); *cf.* B.I.P.C. 20: 549.

The Forest Fiber Products Company, Forest Grove, Ore., will double production of its "Forest Hardboard" in the next three months, bringing production to a total of 2.5 million sq. ft. per month. 3 illustrations. M.W.

BOARD SIZING

MÜLLER, MARTIN. Wet-strength boards for packaging. Wochbl. Papierfabr. 79, no. 17: 543-5; no. 18: 575-8 (Sept. 15, 30, 1951). [In German]

Reference is made to the appearance of water-repellent, wet-strength, and waterproof boards on the market without definitions of the exact meaning of these terms or the existence of critical testing procedures for their evaluation. The author attempts a description of the possibilities and limitations of beater or surface-sized boards which were treated with rosin, wax, bitumen, tarlike products, sodium silicate, starch, cellulose derivatives, and different synthetic resins; handmade binder's board, containerboard, leatherboard, and laminated board receive consideration. For testing the water absorptivity of such boards, the author suggests the immersion in water of a weighed, conditioned sample, 10×10 cm. in size, for a definite period (0.5 hour for quick orientation and three hours for comparative experiments) followed by weighing; the swelling degree may be determined on the same sample by measuring its caliper. However, these two values give only a general indication and should be supplemented by tests for the dry- and wet-strength properties of the samples, at least, the bursting strength; unfortunately, the necessary testers are usually lacking in the average board mill. The swelling values also give an indication for the required adhesive; high values show the need for concentrated glues which contain little water, whereas standard preparations will be satisfactory in the case of low swelling numbers. Examples of the influence of water hardness, precipitating agent, dyes (sap brown), drying temperature, and thickness of board for different sizing

treatments are given to show the many factors which exert an influence upon the results. Special reference is made to the harmful effect of calendering and to the fact that every board caliper will only stand a certain number (usually not more than three) of passes through the rolls of a stack. The converter generally specifies a certain caliper essential for his converting machinery; a repeated passage of the sized board between the calender rolls to obtain the specified caliper may nullify the sizing effect altogether. No hard and fast rule can be given as to the number of permissible passes; this has to be determined by trial for each individual board and calender stack. The favorable influence of synthetic resins upon wet strength is mentioned; however, for most German applications, the natural sizing agents will suffice. 1 table and 12 figures. E.S.

BOARD SPECIALTIES

ANON. Corrugated boxes help make a building. Boxboard Containers 69, no. 707: 45 (November, 1951).

Waterproofed corrugated boxes were employed for the first time for providing air spaces within precast concrete slabs, which were then used in the construction of three wards of the Rancho Los Amigos hospital of Los Angeles County. The boxes proved so successful for insulation purposes that additional wards of the same construction are planned. 1 illustration. M.W.

BROOM

ENGEL, KURT. Fibrous raw materials from German plantations. Wochbl. Papierfabr. 79, no. 14: 447-8 (July 31, 1951). [In German]

Reference is made to the utilization of waste land in Germany for growing suitable fibrous raw materials for the paper industry and to the preliminary work of Max Seyfarth, who established the suitability of broom pulp for certain paper and board types. The success of any project of this type will depend on carefully planned cultures in concentrated areas. E.S.

CALCULATIONS

KOTTE [HANS] The determination of the length of paper in rolls. Allg. Papier-Rundschau no. 17: 745; no. 22: 947 (Sept. 12, Nov. 26, 1951). [In German]

Formulas for the calculation of the length of the paper web in a roll are given. Reference is made to the work by Strahringer (*cf.* B.I.P.C. 11: 277) and a new method by Max Schirmer (*cf.* Das Papier 2, no. 5/6: 115-17 [March, 1948]). 1 diagram and 2 references. E.S.

CELLULOSE—HEMICELLULOSE

BJÖRKQVIST, K. J., and JØRGENSON, L. Hemicellulose extracted from wood holocellulose swollen in liquid ammonia. Acta Chem. Scand. 5, no. 6: 978-9 (1951). [In English]

Vacuum-dried chlorite holocelluloses from birch and spruce were subjected to treatment with liquid ammonia at 70°C., and allowed to stand at room temperature for 30-40 hours. The swollen holocellulose was then in each case extracted successively with hot water, 1% sodium carbonate, 2% sodium hydroxide, and 5% sodium hydroxide. Each hemicellulose fraction was recovered, the yield determined and, after hydrolysis, an analysis made for galactose, glucose, mannose, arabinose, and xylose. No marked drop in

D.P. of the cellulose could be observed. The fractions varied markedly from those obtained by direct alkaline extraction of unswollen holocellulose. 3 tables and 8 references. L.E.W.

HARWOOD, V. D. Cupriethylenediamine as a reagent for hemicellulose separation from wheat straw holocellulose. Can. J. Chemistry 29, no. 11: 974-85 (November, 1951).

Wheat straw and wheat-straw holocellulose were dispersed in aqueous cupriethylenediamine solutions and fractionated by graded precipitation with acid and alcohol. From the holocellulose a 25.4% recovery of hemicellulose containing negligible quantities of hexoses was achieved. The corresponding product from wheat straw was contaminated with both lignin and cellulose, but a comparison of the chemical compositions of the two hemicelluloses showed that the acid chlorite used for delignification had caused very little hydrolytic action. The acetate of the hemicellulose from holocellulose was fractionated from chloroform solution by the addition of petroleum ether into a series of fractions and subfractions. Analysis of representative fractions from this series led to the conclusion that the hexoses present were not chemically combined with pentosan. Molecular weights were determined by periodate oxidation, the Signer isothermal distillation method, and from the lowering of the vapor pressure of their chloroform solutions and showed that the hemicellulose molecules were relatively small (mol. wt. $< 10{,}000$). The decreasing ratio of xylose to arabinose in the fractions of lower molecular weight indicated increasing chain branching. 8 tables and 34 references. E.S.

CELLULOSE—HOLOCELLULOSE

FOSTER, D. H., and WARDROP, A. B. The crystalline structure of cellulose as revealed by acid hydrolysis. Australian J. Sci. Research A 4, no. 3: 412-22 (September, 1951).

The hydrolysis of holocellulose from *Eucalyptus regnans* F. v. M. has been studied by the application of a percolation technique and with the use of 2% sulfuric acid for varying times of hydrolysis (0 to 6 hours) and at three temperatures (150, 160, and 170°C.). For comparison a series of experiments at 160° on cotton was also carried out. The course of hydrolysis of the resistant cellulose in each experiment could be represented by the equation for a first-order reaction. The "reaction constant" for cotton was smaller than that for holocellulose. Powder x-ray diffraction photographs were made of samples at each stage of hydrolysis in the 160° series. From these photographs the breadth at half maximum intensity of the line corresponding to the (002) planes, and the combined lines corresponding to the (101) and ($\bar{1}$01) planes was determined by photometric measurement. Throughout the period of hydrolysis studied, the line breadths decreased for both holocellulose and for cotton. This observation is considered to indicate the existence of a distribution of the degree of lateral order of the crystalline regions in each sample. The narrow line breadths in the cotton series may indicate the existence of greater lateral order in the cotton than in the wood holocellulose and may account for the observed smaller reaction constant for cotton. The results obtained are consistent with the view that the mesomorphous regions surrounding the micelles are more extensive in wood holocellulose than in cotton. 5 tables, 5 figures, and 16 references. E.S.

CELLULOSE—OXYCELLULOSE

PATEL, GORDHANBHAI MATHUR. Optical investigations on oxy-

celluloses. Makromol. Chem. 7, no. 1: 12-41 (July, 1951). [In English]

In the first part of the study an attempt is made to differentiate between the orientation of methylene blue molecules in dichromate and periodate-chlorite oxycelluloses, and to determine the manner in which they are oriented in cellulose dyed from alcoholic solution where the molecules are merely adsorbed. The object of the second part is to determine the effect of periodic acid and chromic acid on the refractive indices. In both cases, hypobromite oxycellulose was examined for comparison purposes. In the final part of the study, periodate-chlorite, dichromate, and hypobromite oxycelluloses were studied with the aid of the light and electron microscopes. Dichroism measurements failed to show any difference in the orientation of methylene blue molecules between different oxycelluloses; in all cases, when a sufficient degree of oxidation is reached, methylene blue is absorbed in a dimeric form. Refractive index measurements and electron microscopic observations agree with conclusions from x-ray data. The periodate reaction is a permutoid reaction, and distortion of molecular chains in the micellar strands occurs as a result of intermicellar swelling. Chromic acid oxidizes chiefly the paracrystalline regions, and hypobromite attacks and dissolves the interfibrillar binding material. In all three types of oxycelluloses, transverse disintegration of the microfibrils occurs when a sufficient degree of oxidation is reached. 1 table, 14 figures, and 3 plates. M.W.

CELLULOSE ESTERS

TOUEY, GEORGE P. Sodium cellulose sulfate. Modern Plastics 29, no. 3: 109-10, 112, 114, 183-4 (November, 1951).

Sodium cellulose sulfate is an odorless, nonflammable, nonhygroscopic pale powder which is a neutral sulfate ester salt of cellulose with a sulfur content of 5-7%. It is stable to heat, to ultraviolet light, and to storage, and is insoluble in organic solvents, but soluble in both hot and cold water. The product is produced in two viscosity types, medium and low, and its viscosity increases with an increase in concentration and decreases with a rise in temperature. The low-viscosity type is compatible with acids, bases, and the common metallic salts. Aqueous solutions of the product are compatible with other water-soluble materials and tolerate relatively large amounts of water-miscible solvents. Films can be prepared from the aqueous solutions which are colorless, transparent, strong, flexible, and highly resistant to penetration of oils. They can be made water resistant by employing aldehyde-type cross linkages. Laboratory tests have indicated that the product can be used in paper and textile sizes, detergents, water and emulsion paints, adhesives, etc. The films of the product can be used in preparing oilproof paper containers. 3 figures and 14 references. M.W.

CELLULOSE ETHERS

SCHERER, PHILIP C., and IACOVIELLO, JOHN G. Fractionation of ethyl cellulose; effect of degree of substitution. Rayon and Synthetic Textiles 32, no. 11: 47-50, 52 (November, 1951).

A procedure was developed for the fractionation of ethylcellulose with ethoxy contents ranging from 44.2% to 49.2%. (It was found to be impossible to dissolve samples whose ethoxy content was less than 43.5%.) Fractionation was possible if the solvent and nonsolvent were chosen with a consideration of the change in polar-nonpolar ratio of the ether as a result of a change in ethoxy content. In this procedure a benzene-methanol mixture was employed, and the results indicate that it is possible to isolate from a

series of ethylcelluloses a group of fractions, each of which would have the same D.P. but whose ethyl content would be that of the original ethylcellulose. The principle effect of the degree of substitution on the fractionation procedure is the necessity of so modifying the polar-nonpolar nature of the solvent as to produce a satisfactory solution from which fractionation may be carried out. 3 tables and 3 references. M.W.

CHEMICAL LITERATURE

WEIL, B. H. The literature summary. J. Chem. Education 28, no. 11: 572-5 (November, 1951).

Various forms of the literature summary, which is a means of presenting a compilation of bibliographic material in a seminarrative style with an analysis of the data by the author, are described and contrasted to other means of handling data, such as an annotated bibliography or an abstract bulletin. M.W.

CHEMICAL TESTING—PULP—ACID NUMBER

MACHIDA, S. Fine structure of cellulose molecules. Carboxyl groups in cellulose molecules. J. Japan. Tech. Assoc. Pulp Paper Ind. 5, no. 5: 406-8, 446 (October, 1951). [In Japanese; English summary]

A review of the literature on the identification of carboxyl groups in cellulose is presented. 22 references. E.G.S.

CHEMICAL TESTING—SODIUM PENTACHLOROPHENATE

HASKINS, W. T. Colorimetric determination of microgram quantities of sodium and copper pentachlorophenates. Anal. Chem. 23, no. 11: 1672-4 (November, 1951).

As an aid in the study of their molluscacidal properties in natural waters, a rapid method for the determination of microgram quantities of sodium and copper pentachlorophenates in dilute aqueous solution was developed. Wallin's method (*cf.* B.I.P.C. 21: 84) using methylene blue was modified and adapted to read the results with color standards for field use. It is effective for concentrations between 1 and 100 p.p.m. with a 5-ml. sample. A more precise spectrophotometric method was developed for laboratory use which is based on the formation of a chloroform-soluble complex between tetra- and pentachlorophenates and Safranine O in bicarbonate-buffered solutions. This is useful for determining 5 to 50 micrograms in a 5-ml. sample. With suitable modifications, such as steam distillation techniques, both methods may be adapted to the determination of pentachlorophenols in relatively small samples of solids or nonaqueous solutions. 1 table and 3 references. M.W.

CHLORINE

FREITAG, RUDOLF. New methods for chlorine manufacture desired. Wochbl. Papierfabr. 79, no. 13: 416-17 (July 15, 1951). [In German]

The possibilities of chlorine preparation without simultaneous manufacture of caustic soda are reviewed briefly. E.S.

COLORIMETRY

CHRISTENSEN, JENS. A practical method for measuring and re-

cording color. Norsk Skogind. 5, no. 9: 265-70 (September, 1951). [In Norwegian; English summary]

The author describes a method for measuring and recording colored surfaces with a Photovolt reflection meter by means of three tristimulus filters (blue, green, and yellow); this is followed by graphical procedures which translate the trichromatic coefficients into hue, saturation, and reflection, and which are explained in detail. Examples are given to show the applications of this method for dyeing and producing white shades of paper and possible economies in the use of different dyestuffs. 10 tables and 12 diagrams. E.S.

CONTRACT PACKAGING

ACE EXPORT PACKING COMPANY, *Chicago.* Flexibility lets Ace Export handle many jobs at once. Packaging Parade 19, no. 226: 66-7, 72-3 (November, 1951).

The Ace Export Packing Company specializes in JAN-packaging for companies which do not have the facilities for military packaging. After receiving the items from the customer, all details of preservation, packaging, packing, and marking are handled by the company, and the products are then shipped directly to their respective destinations, in accord with contract provisions. The way in which the company carries out its various packaging procedures is described. 6 illustrations. M.W.

CORROSION

COMPTON, K. G., ARNOLD, S. M., and MENDIZZA, A. Effect of packaging on corrosion of zinc plated equipment. Corrosion 7, no. 11: 365-72 (November, 1951).

A study of the protection against corrosion offered by various types of containers of zinc-plated telephone apparatus is reported. Corrosion to an extent comparable to that encountered in the field from condensation of atmospheric moisture was produced in the laboratory. The greatest corrosion occurred when the zinc-plated parts were packed in plywood boxes, somewhat less in fiberboard, and least when packed in corrugated paper boxes. The differences in the extent of corrosion were believed to be primarily a result of inherent physical properties of the packing materials, of which moisture absorption rates were probably of first importance. Heat transfer rates may also possibly be significant. No conclusive evidence of a possible accelerating effect of traces of acetic acid from the plywood was found. It was shown, however, that a supplementary chromate treatment of zinc-plated parts provides a marked increase in resistance to corrosion. 3 tables, 14 figures, and 3 references. M.W.

HOSE, A. G. Corrosion of Fourdinier wire cloth. Paper Trade J. 133, no. 21: 22-3 (Nov. 23, 1951); Paper Mill News 74, no. 47: 16 (Nov. 24, 1951); Southern Pulp Paper Manuf. 14, no. 12: 62-3 (December, 1951).

Corrosion in used wire cloth may be either chemical or electrolytic. The types of electrolytic corrosion are: galvanic, intergranular, pitting, and corrosion-erosion. Corrosion fatigue is another factor which can contribute to a wire-cloth failure. M.W.

JOP. Damage to construction materials by stray currents. Wochbl. Papierfabr. 79, no. 16: 512-13 (Aug. 31, 1951). [In German]

Reference is made to the corroding effect of stray currents (particularly when d.c. current is employed) on buried piping systems and machinery in general. Faultless cables and appropriate insulation are the best protection. E.S.

SVENSKA PAPPERS- OCH CELLULOSAINGENIÖRSFÖRENINGEN. *Sulfatkorrosionskomittén.* Communication from the sulfate corrosion committee regarding digester corrosion. Svensk Papperstidn. 54, no. 20: 709 (Oct. 31, 1951). [In Swedish] *cf.* B.I.P.C. 20: 860.

A brief reference is made to the influence of a high sulfidity in the white liquor and the silicon content of mild steels upon the corrosion rate of sulfate digesters. Confirming evidence by Huseby and Scheil (*cf.* B.I.P.C. 21: 693) is cited. 1 figure and 2 references. E.S.

DECULATOR PROCESS

S. W. The Deculator process for deaerating pulp suspensions. Wochbl. Papierfabr. 79, no. 18: 578-9 (Sept. 30, 1951). [In German] *cf.* B.I.P.C. 21: 693.

The process and required machinery are described. E.S.

DE-INKING

FALDNER, JOSEF. Stock preparation and regeneration of printed waste paper. Wochbl. Papierfabr. 79, no. 17: 546 (Sept. 15, 1951). [In German]

The advantages of sulfonated alcohols and similar compounds (Igepon, Gardinol, Lanaclarin, etc.) as emulsifying agents for deinking printed waste paper are pointed out. E.S.

PALLADINO, A. J. Demonstration plant for treatment of de-inking waste. Sewage Ind. Wastes 23, no. 11: 1419-24 (November, 1951); *cf.* B.I.P.C. 21: 314; 22: 101-2.

The design features of the deinking waste-treatment plant of the Kalamazoo River Improvement Company, the operating techniques which are employed, and the aids which are used to evaluate the operating conditions are described. 3 tables, 4 figures, and 5 references. M.W.

DIE-CUTTING

PARSONS, BASIL M. Improved corrugated die-cutting. Fibre Containers 36, no. 10: 30, 32, 37, 40, 42, 47 (October, 1951).

The author mentions some of the many uses of platen cutting and creasing presses and describes their operation with folding boxboard and corrugated and solid fiberboard, with particular emphasis on the importance of proper make-ready. 7 illustrations. M.W.

DIGESTERS

KEYES, JOSEPH F. Controls, circulation, and indirect heaters on digesters. Tappi 34, no. 11: 76A, 78A (November, 1951).

The author discusses the unsatisfactory experience of the North Carolina Pulp Co., with indirect heaters and circulating pumps; at present all pulp in this mill is cooked by direct steaming without circulation. The satisfactory

operation is ascribed to the installation of time-cycle steaming controllers and automatic gas-off control instruments which are outlined briefly. The important part played by the correct construction and installation of strainers in the gas-off system is emphasized. E.S.

DRYING—PAPER

NETTL, O. Paper drying with Yankee machines. Wochbl. Papierfabr. 79, no. 14: 450-1 (July 31, 1951). [In German]

An economical suggestion is given to paper mills which operate Yankee machines, own a hydroelectric plant or purchase power from a nearby station under favorable terms, use live steam for drying, and are interested in the lowest possible steam consumption for this purpose. An oil-heated boiler is installed in the vicinity of the Yankee drier and supplies the necessary steam; its pressure corresponds to the permissible pressure in the Yankee drier and is adjusted during operation to the drying requirements of the particular run of paper. 1 illustration. E.S.

DYES AND DYEING

CORNELY, B. The aniline dyes in the paper industry; a historical study of their first appearance. Allg. Papier-Rundschau no. 20: 856-8 (Oct. 26, 1951). [In German]

The first aniline dyestuffs were probably introduced into the paper industry around the year 1863; the first dye was fuchsin, which at that time was generally known by the name "Aniline red." The author attempted in vain to locate references to the first mill which experimented with these new dyestuffs; no information could be found in either the literature or still-existing documents of manufacturers, merchants, or paper mills. A resume (based on the pertinent literature prior to 1881) is presented which shows the approximate date of introduction in the industry of a number of early aniline dyes, as well as the difficulties which the papermakers encountered; paper dyeing at that time was definitely an art. Nearly all references emphasize the poor fastness to light of the new products. However, around the year 1880, the use of aniline dyes for paper had already become so well established that the natural dyes were only employed to a limited extent. Several old dye recipes are included. 5 footnotes and a few additional references in the text. E.S.

ECONOMICS, INDUSTRIAL

RUMPF, A. NEWELL. Paper industry economics. Southern Pulp Paper Manuf. 14, no. 11: 20, 23 (November, 1951); Tappi 34, no. 11: 128A, 130-1A (November, 1951); Am. Boxmaker 40, no. 10: 19-20 (October, 1951); Fibre Containers 36, no. 12: 58, 60 (December, 1951). *cf.* B.I.P.C. 21: 315-16.

The author cites the reasons which place the paper industry high on the list of those which present sound investment risks, such as its general stability and its recent modernization and expansion. The considerations taken by bankers in their deliberations and decisions as to the stability of a firm (character and ability of management, financial assets, operations, and prospects), the stability of the industry, the growth in production, capital requirements, consumer demand, cost-price relationships, and trends in profit margins are discussed. The rate of return after taxes on stockholder investment in paper and allied-product firms compares favorably with other industries; in a study of 25 industries, only industrial chemicals, office and store machines, motor vehicles, motor-vehicle equipment, and electrical

machinery and equipment showed a better rate of return than the paper industry. E.S.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

SULPHITE PULP MANUFACTURERS' RESEARCH LEAGUE. New evaporator to be tried on spent sulphite liquor. Chem. Eng. 58, no. 11: 250 (November, 1951).

Studies of the evaporation of spent sulfite liquor will be made on an experimental evaporator recently installed at the League's pilot plant in Appleton, Wis. The new evaporator provides a bed of lime salts to attract the crystallization of lime salts present in the liquor away from the evaporator surface. If it proves to be successful with spent sulfite liquor, it will permit the use of much simpler evaporation equipment than any previously developed for the purpose. M.W.

FIBER—STRUCTURE

RITTER, GEORGE J. Microscopic polarized light method for studying cellulose fibers. Paper Ind. 33, no. 8: 926-31 (November, 1951).

The correlation between microscopic and x-ray data indicates that the high refractive index plane is oriented parallel to the lengthwise direction in cellulose crystallites of both fibers and ray cells, and that the simpler method may be used in place of the x-ray procedure. Photomicrographs both in black and white and in color taken in polarized light are reproduced; they indicate that the crystallites in fibers are arranged generally with their long axis parallel to the long axis of the fibers, but crosswise to the long axis of ray cells. Fibers shrink largely in their crosswise directions and ray cells in the lengthwise directions as indicated by microscopic study. On the basis of his experiments, the author has re-examined the shrinkage of wood and pointed out probable errors in previous explanations of shrinkage phenomena. 13 photomicrographs and 3 references. L.E.W.

STAUDINGER, MAGDA. Macromolecular compounds. [347] Cellulose. [103] The morphology of natural and synthetic cellulose fibers and their nitrates. Makromol. Chem. 7, no. 1: 70-81 (July, 1951). [In German; French summary]

A series of photomicrographs of the native and nitrated fibers of whole and degraded cellulose and of the cleavage of the latter are presented. The variation in behavior of native and regenerated or nitrated fibers is attributed to the differences in their fiber structure, since the molecular arrangement of the native fibers is much more uniform than that of the others. 2 tables, 24 photomicrographs, and 23 references. M.W.

FOAM

ROSS, SYDNEY, and YOUNG, G. J. Action of antifoaming agents at optimum concentrations. Ind. Eng. Chem. 43, no. 11: 2520-5 (November, 1951).

The mechanism underlying the action of foam-inhibiting agents was studied. The antifoaming effect at the optimum concentration of each agent was compared with the viscosity, the spreading coefficients, and the entering coefficients for each of two aqueous foaming solutions containing surface-active agents. The sign of the spreading and entering coefficients is usually

positive for a foam-inhibiting agent. No precise correlation was found to exist between the magnitudes of the properties here reported, although usually a large positive spreading coefficient and a low viscosity are associated with a more effective foam-inhibiting action. Two distinct effects of foam inhibitors could be distinguished. With some, the agent promotes the rate of drainage of liquid from the foam films without affecting significantly the final thickness of the film at which its rupture takes place. This effect is believed to be the result of a decreased surface viscosity produced by the presence of the agent. Other agents cause the rupture of thick liquid films before drainage of liquid has thinned them to the breaking point. Many agents produce combinations of the two effects. 6 tables, 3 figures, and 11 references. E.S.

FOREST FIRES

KINGSTON, G. F. The need for training in fire fighting crews. Pulp Paper Mag. Can. 52, no. 11: 159 (October, 1951).

Statistics are given which show that under today's conditions 92% of forest-fire suppression work in Canada is done by ordinary woods labor. The need is stressed for a planned training program for these men which would include the preorganization of all camps into potential fire-fighting crews and the clear delegation of responsibility for action in case of fires in addition to instructions in the proper use of tools and basic fire-fighting tactics. M.W.

STEWART, G. I. Engineering in forest protection. Mech. Eng. 73, no. 6: 477-80, 495 (June, 1951); Tappi 34, no. 11: 14A, 16A, 18A, 20A, 22A (November, 1951).

The author discusses the important part played by mechanization in forest-fire control and the application of engineering techniques to equipment development; the evolution of plowing machinery is used as an example. 5 illustrations. E.S.

FUNGI

GREATHOUSE, GLENN A., WESSEL, CARL J., and SHIRK, HAROLD G. Microbiological deterioration of manufactured materials. Ann. Rev. Microbiol. 5: 333-58 (1951).

A review is presented of the recent research and literature pertaining to the microbiological deterioration of the following: textiles and cordage, paper, leather, paints, plastics and plasticizers, rubber, hydrocarbons, metals, and glass. 105 references. M.W.

GAS TURBINES

JOHNSON, W. E. P. The applicability and present state of gas turbine technology. Paper-Maker (London) 122, no. 5: 323-6, 328, 330-1 (November, 1951); World's Paper Trade Rev. 136, no. 19: 1345-8, 1353-6, 1358 (Nov. 8, 1951).

The author outlines the special advantages of gas-turbine systems and discusses their possibilities in the pulp and paper industry. 14 diagrams. E.S.

GROUNDWOOD PULP

ARESIN. The shower water during the grinding process. Wochbl. Papierfabr. 79, no. 13: 415-16 (July 15, 1951). [In German]

Examples from the operation of continuous, pocket, and Roberts grinders are given to illustrate the importance of the correct installation of shower pipes and dosage of spray water. By the correct adjustment of shower water and stone burring, the properties of the resultant pulp may be influenced within wide limits. 3 figures. E.S.

GUMS AND RESINS

SMITH, F. The constitution of mesquite gum. Part III. The structure of the monomethyl glucuronic acid component. J. Chem. Soc.: 2646-52 (October, 1951); *cf.* B.I.P.C. 19: 163.

Prolonged hydrolysis of mesquite gum yields 4-methyl-D-glucuronic acid which has been characterized by means of the α- and β-form of 4-methyl-D-glucuronoside amide. These have been converted into the corresponding crystalline amides of 2,3,4-trimethyl methyl-D-glucoronoside. Oxidation of the methyl ester of 4-methyl methyl-D-glucoronoside (I) first with sodium periodate and then with bromine, followed by hydrolysis, gives L-*erythro*-2-hydroxy-3-methoxysuccinic acid and glyoxylic acid. Reduction of (I) catalytically or by lithium aluminum hydride yields 4-methyl methyl-D-glucoside and this, on hydrolysis, gives 4-methyl-D-glucose. The latter gives crystalline 4-methyl-D-glucose phenylosazone identical with an authentic specimen prepared by an unambiguous synthetic procedure. E.S.

HEATING (INFRARED)

ENGEL, KURT. The fundamental principles and problems of infrared drying. Wochbl. Papierfabr. 79, no. 10: 300, 302-4 (May 31, 1951). [In German]

Following a brief discussion of the physical fundamentals of infrared drying, the experimental arrangement of Déribéré (*cf.* Papeterie 65, no. 6: 127-31 [June, 1943]) for measuring the absorption and reflection of infrared rays by the material to be dried and the factors which influence their magnitudes (moisture content, salts dissolved in water, dyestuffs, fillers, and sizing agents) are described. Possible applications in the paper industry are outlined, such as drying of the web (particularly as supplementary drying, because the exclusive use of infrared rays, although technically feasible, is economically unsound), drying of felts and, particularly, in paper conversion and printing. 6 figures. E.S.

HERBERT PRODUCTS, INC. Simplicity featured in new drying oven for web presses. Am. Paper Converter 25, no. 11: 20, 22 (November, 1951).

A new drying oven for flash-drying on high-speed web presses delivers heat from reflector-type heating units whose surface temperature is 1400°F. The oven heat is adjustable within a 350° differential, and a thermostatic control maintains the desired temperature. To prevent scorching or weakening of the web, it is designed to move the heating units away from the web and to open vent doors automatically whenever the press is stopped. 3 illustrations. M.W.

HISTORY

SHORTER, ALFRED H. Early paper mills in Kent. Paper-Maker (London) 122, no. 4: 253-4, 256, 258 (October, 1951).

An investigation into the origin of the early paper mills in the county

of Kent brought to light that at least 20 mills were operating in the period from 1588 to 1738. Brief reference is made to the documents and information available on these mills. 77 references. E.S.

STOBBE, O. Glimpses of the beginnings of the boxmaking industry. Allg. Papier-Rundschau no. 17: 741-2 (Sept. 12, 1951). [In German]

Reference is made to two old patents which revolutionized the German boxmaking industry: German patent 61,121 granted in 1892 to Theodore Remus covering the Remus board-bending process, and German patent 77,239 granted to Karl Krause in 1894 covering the Krause creasing method. Historical details of the development of these two processes and their influence on the European industry are given. Neither method played a role in America where Robert Gair applied for a patent covering the first cutting and creasing press in 1879; although he never obtained a patent for his invention, the enormous development of the American folding-box industry started with Gair's cutting and creasing press. 1 reference. E.S.

KRAFT PULP AND PAPER

ALLEN, JOHN W. Open door to kraft expansion in the state of Washington. Fibre Containers 36, no. 11: 66, 68, 73 (October, 1951).

An adequate supply of wood, water power, and chemicals, and an extensive market for kraft paper products are evidence that optimum conditions exist for the construction of new kraft mills in Washington. The construction cost is estimated at about $75,000/ton of daily production. 2 tables. M.W.

EVERY, DERNELL. New fields opening for kraft paper. Am. Paper Merchant 48, no. 11: 26, 51, 53 (November, 1951).

The demand for kraft paper appears to be approaching a balance, and when that occurs, the wrapping paper shortage will be quickly corrected. Kraft paper was formerly considered as a barometer of the paper market, but as a result of the growth of the industry, it is no longer sensitive to short-term business fluctuations, and paperboard or waste paper are more sensitive to market trends. The greater stability of the kraft industry reflects the same tendency in the paper industry as a whole. Future expansion of kraft paper manufacturers should be in the field of specialty papers. M.W.

LIGNANS

LEOPOLD, BENGT, and MALMSTRÖM, INGA-LILL. Constitution of resin phenols and their biogenetic relations. XV. Nitrobenzene oxidation of compounds of the lignan type. Acta Chem. Scand. 5, no. 6: 936-40 (1951). [In English] *cf.* B.I.P.C. 20: 599.

The authors have continued their study of the alkaline nitrobenzene oxidation of lignin model substances (*cf.* B.I.P.C. 21: 700) with oxidations of a number of compounds belonging to the lignan group. The generalization in the earlier paper that, provided the side chain contains several oxygen atoms or a double bond, the major factor determining the yield of vanillin is the arrangement of the carbon skeleton, was found not to apply in the case of the lignans. Total yields of vanillin and vanillic acid obtained were: olivil, 86%; lariciresinol, 68%; pinoresinol, 40%; mataireSinol, 17%; iso-olivil, 3%; and conidendrin, 1%. These results supported the earlier findings that a carbon

atom attached to an aromatic nucleus (as in iso-olivil and conidendrin) is not split off under the conditions employed. 2 tables, 9 figures, and 14 references. I.A.P.

LIGNIN

U. S. FOREST PRODUCTS LABORATORY, *Madison, Wis.* What present and potential uses are there for lignin? Wood 56, no. 11: 54 (November, 1951).

The present small-scale uses and proposed uses for lignin include: an additive to the negative plates of storage batteries to improve their efficiency at low temperatures, to Portland cement to improve its flow properties, and to plastics and plastic laminates; an extender for rubber; an adhesive for linoleum; a binder for sand and on roads; an antiscaling agent for boilers; a tanning agent; a raw material for the chemical production of vanillin and hydrogenation products; a fuel; and a soil conditioner. M.W.

MACHINERY

K. Centrifugal casting for large pieces of equipment. Wochbl. Papierfabr. 79, no. 13: 417-18 (July 15, 1951). [In German]

The application of centrifugal casting to drying cylinders, rolls, suction rolls, etc., in the paper industry, as well as for long pieces of piping is described briefly. 1 illustration. E.S.

PAPER MILL NEWS. Hayden plant expanding. Paper Mill News 74, no. 46: 142, 144 (Nov. 17, 1951).

Recent developments at the Hayden Wire Works, Inc., West Springfield, Mass., comprise the expansion of plant facilities to include a metallizing and blasting unit for the repair and rehabilitation of paper-mill equipment and the expansion of the machine shop. In the metallizing plant cylinder shafts and other types of rolls and journals are coated with a noncorrosive metal. A new type of Hayden cylinder which is designed to reduce excess turbulence to a minimum is also mentioned. 3 illustrations. M.W.

MACHINERY—BEARINGS

ANON. The advantages of tapered roller bearings in paper making machines. World's Paper Trade Rev. 136, no. 14: 969-72, 977-9 (Oct. 4, 1951).

The principle of the tapered roller bearing, variations to suit particular applications, methods of mounting, and the use for papermaking machinery are discussed. Examples of applications to pumps, reduction gears, and drives for pulpers, jordans, refiners, and different types of rolls (shaker, breast, wire, and press rolls) are given. 11 figures. E.S.

MACHINERY—BEATERS

ANON. The Jones beating unit. Paper Trade J. 133, no. 20: 29, 38, 40 (Nov. 16, 1951).

The new Jones beating unit is a beater-type stock-preparing machine which embodies all the features of the Jones-Bertrams beater and is preassembled and sold as a package unit. New features include the position of the drive motor over the backfall and the completely automatic roll-pressure control. The design of the unit makes it readily adaptable to continuous beating. 4 figures. M.W.

ANON. Midwest Fulton new beater. Paper Trade J. 133, no. 18: 40-2 (Nov. 2, 1951); Southern Pulp Paper Manuf. 14, no. 11: 52 (November, 1951).

The Midwest Fulton automatic continuous beater is described. Its function is to provide a means whereby any kind of fiber may be treated continuously to develop the maximum desirable Mullen, tensile, and tear characteristics. Because no power is required for circulating stock and because there is no actual metal-to-metal contact between the roll and bedplate, the use of the beater will result in a 30 to 50% saving of power. The beater is designed to be used as a single unit or may be combined in series or arranged in tandem. 5 illustrations in the first reference and 3 in the second. M.W.

MACHINERY—BELTING

PIRINEN, U. V-belt power transmission. Paper and Timber (Finland) 33, no. 10: 317-18, 320-1 (October, 1951). [In Finnish; English summary]

The advantages of V-belt power transmission are discussed, and calculations are presented for determining suitable dimensions, optimum speeds, minimum pulley sizes, etc. 5 tables and 2 diagrams. E.S.

MACHINERY—CONSISTENCY REGULATORS

SCRIVENS, D. B. A new development in consistency control of paper stocks. Pulp Paper Mag. Can. 52, no. 3: 236-42, 293 (Convention, 1951); Proc. Tech. Sect., Can. Pulp Paper Assoc. 37: 60-7 (1951).

A report is presented of the work in progress during recent years to improve the consistency regulation of the groundwood, sulfite, and broke stocks going to the newsprint machines at the Spruce Falls Power & Paper Co., Kapuskasing. Following a brief listing of the important facts upon which good consistency controls depend, the first steps in the program are described which involved certain changes in the equipment and consistency control instruments in the mixing room and the relocation of several units. Propeller agitation for all chests was provided. Each consistency regulator (lever and dashpot assemblies) was equipped with an air-operated controller to measure and control the float level. A separate source of white-water supply from the paper mill cloudy white-water chest, exclusively for the use of the consistency regulators, and a new type of headbox were then developed. An alarm system was incorporated to warn the operators of any excessive change in consistency. Definite improvements in control were noted as each instrument was put into service, so that a reduction in routine testing to twice a shift became possible. 10 figures, including a flowsheet of the mixing room. E.S.

MACHINERY—CONVERTING MACHINERY

AMERICAN STORES COMPANY, *Philadelphia.* Saddling the bag. Modern Packaging 25, no. 3: 104-5, 195 (November, 1951).

A new automatic machine that delivers fully imprinted bag-top labels, folded and ready to apply, is described. The machine is, essentially, a miniature rotary press. It is fed by a continuous web of three-color preprinted labels to which it adds the specific information such as product name, weight, price, and code date. It cuts off the label and delivers it prefolded ready for the operator to apply to the bag. Saddle-type labels so printed permit the use of completely transparent bags for prepackaged fruits and vegetables. 6 illustrations. M.W.

CHAMPLAIN COMPANY, INC., *Bloomfield, N.J.* It prints—it die cuts—it strips—in one pass of stock through tandem equipment. Boxboard Containers 69, no. 707: 6-7, 9, 11, 13 (November, 1951).

The development and operation is described of a paper-boxmaking machine which prints, die cuts, and strips folding-carton blanks in one pass of stock through a series of rotary printing units, a platen cutting-creasing unit, and an automatic stripping device which are assembled in tandem. 4 illustrations. M.W.

MACHINERY—FELTS

AGGARWALA, J. C. Press felts on Fourdrinier machine. Indian Pulp and Paper 6, no. 1: 25-8 (July, 1951).

The desirable characteristics, properties, manufacture, degradation, and maintenance of press felts and conditioning equipment are discussed. M.W.

HORNBERG. We felt murderers. Allg. Papier-Rundschau no. 20: 865-6 (Oct. 26, 1951). [In German]

The author emphasizes the destructive action of felt whippers, particularly on board machines in small mills which, as a rule, cannot afford Vickery felt conditioners. For such cases he recommends boxed felt washers with one or two blades installed on the inner side of the felt; the whippers do not come in contact with the felt, but produce elastic water waves and drive them through the felt. Soap or cleaning solutions may be added to the water. A pair of squeeze rolls (one copper and one rubber roll) follow and remove the water used for washing. E.S.

KOTHARI, P. S. Fundamentals of press felts. Indian Pulp and Paper 6, no. 1: 74-5, 77 (July, 1951).

The manufacture of press felts and the relationship between their fundamental characteristics, porosity, finish, and strength, is discussed. 5 figures. M.W.

MACHINERY—FILTERS

CHEMICAL ENGINEERING PROGRESS. Filtration symposium. Chem. Eng. Progress 47, no. 10: 497-507; no. 11: 545-54 (October, November, 1951).

The following four papers which deal with various aspects of filtration compose this symposium: Miller, Shelby A. Recent advances in filtration theory—27 references, p. 497-502; Grace, H. P. What type filter and why—1 reference, p. 502-7; Smith, E. G. Fabric filter media, p. 545-9; and Fuhrmeister, Charles, Jr. Improving filtration and filtration rates, p. 550-4. 34 figures. M.W.

WILSON, G. E. Hardinge automatic backwash sand filter—its use on fresh water and white-water. Pulp Paper Mag. Can. 52, no. 3: 249-51, 294 (Convention, 1951); Proc. Tech. Sect., Can. Pulp Paper Assoc. 37: 144-8 (1951); *cf.* B.I.P.C. 16: 288.

An illustrated description is given of the principles of operation of this filter and its performance in a small mill with a very poor water supply. It was found to be a very satisfactory raw-water filter, and it shows distinct

promise in recovering water, heat, and fiber from low-solids paper mill white water. 3 tables and 7 figures. E.S.

MACHINERY—GEARS

RICHARDZ, F. Application of enclosed gearing in the pulp and paper industry. Tappi 34, no. 11: 498-502 (November, 1951).

Typical applications of enclosed gear drives (motors and speed reducers) in the pulp and paper industry are discussed, with emphasis on their efficiency, safety, reliability, and low maintenance cost. Special reference is made to modern high-speed gear drives for air-conditioning equipment. 5 tables and 8 figures. E.S.

MACHINERY—PAPER MACHINE—YANKEE TYPE

PAPER MILL NEWS. New Beloit machine installed at Northern Paper Mills. Paper Mill News 74, no. 46: 102 (Nov. 17, 1951); *cf.* B.I.P.C. 21: 782.

The new Beloit tissue machine at Northern Paper Mills, Green Bay, Wis., which is believed to be the largest Yankee-type, creped toilet-tissue machine in the world, is described. 1 illustration. M.W.

MACHINERY—PRESSES

ARMSTRONG, BRUCE. A new screw press for pulp bleaching, deinking, and other uses. Pulp & Paper 25, no. 12: 93-4, 96, 98 (November, 1951).

Following a brief description of the new Jackson & Church worm-drive press with a capacity of 150 tons per day, its applications for high-density peroxide bleaching (Du Pont or Becco cold-steep processes), deinking, and extraction of waste liquors or water for bulk storage or bulk shipment are discussed. 4 figures. E.S.

MACHINERY—PULPERS

RHINELANDER PAPER COMPANY. Rhinelander operates Morden "Slush-maker" pulper. Paper Mill News 74, no. 46: 140 (Nov. 17, 1951); Pulp & Paper 25, no. 12: 72 (November, 1951); *cf.* B.I.P.C. 22: 113.

A report on the Morden "Slush-maker" after one month's service at the Rhinelander Paper Co., states that its operation on broke, dry bleached and unbleached kraft pulp, and wet-strength broke has been successful. No detrimental effect as a result of high consistency was noted. To attain better consistency and color control, the possibility of changing the method of furnishing the beaters is under consideration. 1 illustration. M.W.

MACHINERY—REFINERS

SMILEY, L. D. The turbo refiner. Tappi 34, no. 11: 86A, 88A (November, 1951); *cf.* B.I.P.C. 22: 113.

This is the same article as that previously presented by L. F. Herman. E.S.

MACHINERY—SAVE-ALLS

ANON. The Waco filter. Paper Mill News 74, no. 46: 150, 161 (Nov. 17, 1951); *cf.* B.I.P.C. 21: 173.

The Waco filter, a mechanical rotary filter which is used in the paper industry for the recovery of fibers and fillers from mill white water and for the purification of mill fresh water, is described. The filtration is done entirely through a thin, continuous filter sheet made in advance on the wire before it enters the filter drums. As the wire and filter sheet move along, the filter sheet with its fines is couched off. The wire is then washed, and a new sheet is picked up to complete the cycle. The efficiency and capacity of the filter are determined by the formation and thickness of the filter sheet. Low installation and operating costs, simplicity, high efficiency, quick fiber recovery independent of the chemical nature of the white water, and the return of the recovered pulp at a consistency suitable for pulp chests are among the features of the filter which recommend it for pulp- and paper-mill use. 1 illustration. M.W.

MACHINERY—SLITTERS AND WINDERS

WARD, EUGENE J. Slitting and roll winding fundamentals. Paper Trade J. 133, no. 19: 20, 22-4, 26-7 (Nov. 9, 1951); Am. Paper Converter 25, no. 12: 12-13, 58, 60-2, 64 (December, 1951).

The basic principles of the three general classifications of mill-type slitting elements, the rotary shear, the top slitter, and the score cut methods, are discussed, and the various styles of roll winding machines in paper- and board-mill service are described and illustrated. 20 figures. M.W.

MACHINERY—VATS

GOLDSMITH, PHILIP H., JACKSON, JESSE A., and DREW, A. E. Comments on Hollis's article on stock formation on cylinders. Pulp & Paper 25, no. 11: 50; no. 12: 70, 72 (October, November, 1951); *cf.* B.I.P.C. 22: 114.

Comments by the three authors are presented. E.S.

MATERIALS HANDLING

DRAXLER, J. A. More service from power trucks. Paper Trade J. 133, no. 18: 28, 30 (Nov. 2, 1951).

In addition to a preventive maintenance program which includes regular lubrication and periodic checkups, better performance can be obtained from trucks by using trained drivers, insuring that the surface areas where the truck operates are in good condition, and avoiding overloads. 2 illustrations. M.W.

ENGINEERING PRODUCTS COMPANY, INC., *Chicago.* Versatile trackage. Fibre Containers 36, no. 10: 99-100 (October, 1951); *cf.* B.I.P.C. 15: 373-4.

The Epco Trackage System can now be installed to run over a drawbridge that connects two loading platforms. The drawbridge can be raised to allow freight cars to back in. Another unusual installation is a floor scale on which paper rolls can be weighed before storage. 2 illustrations. M.W.

MESOMERISM

SCHERER, PHILIP C., and TESTERMAN, M. K. Dielectric dispersion of cellulose nitrate solutions. J. Polymer Sci. 7, no. 5: 549-65 (November, 1951). [French and German summaries]

The dielectric dispersion of cellulose nitrate solutions in acetone was

studied over a frequency range of 100-500 kc, by a resonance method, using substitution techniques to measure the capacitance. An abnormally narrow region of dispersion was found which could not be reconciled with the Debye type of absorption. When the assumption was made that the solvated chain molecule had the form of a loosely held random coil, it became possible to explain the experimental dispersion curve on the basis of resonance absorption. The similarity of the shape of the dispersion curves to those found for distribution by fractional precipitation suggested a possible correlation between them. In the case of at least one polymer, a high-viscosity cellulose nitrate sample, the derived correlation proved satisfactory. 8 tables, 1 figure, 10 graphs, and 11 references. E.S.

MICROBIOLOGICAL TESTING

REED, ERNEST. Microbiology of certain paper food containers. Tappi 34, no. 11: 524; discussion: 524-5 (November, 1951).

A summation of the data of microbiological studies of certain paper food containers and the materials out of which such containers are made is presented. The products tested in this analysis include various types produced by 33 co-operating plants; they are received in the same way as by the customers of the companies. The types of flora determined on the products were found of no concern from the public-health angle, because no *E. coli* were present. These results are not intended as a complete review of the program in all its phases, but the block of data is considered to give a fair picture of the condition of paper and paper containers used for food purposes from a microbiological point of view. E.S.

MILL MANAGEMENT

STREET, HOWARD H. A way to success. Paper Mill News 74, no. 45: 14, 16-18 (Nov. 10, 1951).

Some of the personal qualities and other factors which are involved in being a successful superintendent and in gaining the respect, confidence, and co-operation of other employees are discussed. M.W.

NEWSPRINT

BHARGAVA, M. P. Newsprint problem in India; an immediate solution. Indian Pulp and Paper 6, no. 1: 20-3, 47 (July, 1951).

The manufacture of newsprint paper from bagasse in India is shown to be a commercially feasible proposition in view of (*a*) the recent remarkable developments in the technique of producing, cheaply and economically, bleached pulps from hardwoods and agricultural residues, (*b*) the easy availability of coal in the country, in supplies adequate to replace bagasse as fuel in sugar factories, and (*c*) the production every year of about 4 million tons of bagasse in sugar factories. M.W.

SINGH, CHATTAR. Newsprint industry; India's potential producing areas for newsprint. Indian Pulp and Paper 6, no. 2: 111-13 (August, 1951).

Since newsprint made from bagasse has been found unsatisfactory, and paper mulberry is not available in sufficient quantities, the remaining pulp raw materials for newsprint which are native to India are the spruce and fir trees in the Kulu forests in Punjab. Because these trees grow at a high elevation in the hills, their extraction and transportation presents serious difficulties, and a study of the use of mechanical logging should be made. A complete survey of the resources of the Kulu forest and of the forests in Himachal Pradesh and Uttar Pradesh should also be undertaken. 2 tables. M.W.

TIPKA, VERNON L. World production and distribution of newsprint paper—1950. Newsprint Service Bur. Bull. no. 406: 2-3, 5-9 (November, 1951); *cf.* B.I.P.C. 21: 176-7.

Newsprint paper production in 1950 was in excess of 9,700,000 tons, an all-time peak and an increase of 6.6% over 1949. The world demand, however, was still not fully satisfied. Of the world total, approximately 64.5% was produced in North America and 28.5% in Europe, exclusive of Russia. The United States showed the greatest gain over 1949, but in almost all countries production was at least equal to 1949. The increase in output can be largely attributed to modernization and improvement of existing plants and equipment. Known world newsprint exports in 1950 exceeded 6 million tons. Approximately 97% of these originated, in order of rank, in Canada, Finland, Sweden, Norway, and the United Kingdom. Production and distribution data for individual countries are given, and a table on the circulation of daily newspapers in various countries is included. 4 tables. M.W.

PACKAGING

BELL & HOWELL COMPANY, *Chicago.* Bell & Howell applies 'modus operandi' to its government packaging. Packaging Parade 19, no. 226: 74-6 (November, 1951).

The company-standardized packaging procedures for the military contracts of a manufacturer of precision photographic equipment are described. 7 illustrations. M.W.

FORD MOTOR COMPANY. *Aircraft Engine Division.* How Ford plans to package 2300 parts. Packaging Parade 19, no. 226: 63-5 (November, 1951).

The packaging plan for some 2300 spare parts of a reciprocating engine is described. After compiling an AMC Form 163B for each item, it was found that 20 basic packaging operations could be used for all the parts. These operations are described on a master operations sheet which also includes a sequence of work. The considerations involved in the planning of the floor layout are mentioned. Examples of the master operations sheet and the packaging information form, AMC 163B, are included. 2 illustrations. M.W.

ROBERT A. JOHNSTON COMPANY, *Milwaukee.* Mechanized for crackers. Modern Packaging 25, no. 3: 96-9, 197 (November, 1951).

The modernization program of the Johnston Company, one of the largest independent producers of crackers and cookies, is described. As the final step in this program, the company is now discontinuing the cellophane carton overwrap. This will result in a considerable saving in labor and of cellophane which may be used for the inner ¼-lb. units of crackers. These units are automatically wrapped and packaged in special double-end, lock-tab cartons. The carton-forming units are coupled to the packaging lines to provide a smooth continuous flow. 7 illustrations. M.W.

WREN, F. A. The influence of self-service on container design. Brit. Packer 13, no. 10: 34-5 (October, 1951).

A package designed for self-service retailing, in addition to affording the maximum possible protection to its contents, should attract attention, stimulate interest, and arouse the desire to purchase, give information about its

contents, and, whenever possible, display them. Transparent packaging materials are recommended as best fulfilling these requirements. 2 illustrations. M.W.

PAPER—COATED

OBER. The Champion coating process. Allg. Papier-Rundschau no. 20: 855 (Oct. 26, 1951). [In German] *cf.* B.I.P.C. 20: 880.

A brief description of the Champion process for machine coating paper and board is given. 1 diagram. E.S.

PAPER—CONVERSION

DAY, FREDERICK T. Paper conversion and usage. No. 18. Treatment to printed and other paper. World's Paper Trade Rev. 136, no. 13: 898, 903 (Sept. 27, 1951); *cf.* B.I.P.C. 22: 124-5.

The conversion processes of dry mounting, pasting, strip and edge hand gumming, and padding are described briefly. 2 illustrations. E.S.

PAPER—CURLING

KOTTE [HANS] The curling of wood-free writing and book papers. Allg. Papier-Rundschau no. 19: 816-17 (Oct. 12, 1951). [In German]

A manufacturer of accounting books receives his supply of supercalendered, wood-free paper in reams from different mills; although all reams are stored in the same cellar under identical temperature and moisture conditions, the paper of certain mills remains nearly flat, whereas that from others exhibits severe curling tendencies which cause trouble in the converting and ruling processes. Advice for the prevention of curling is sought. In the answer the physical causes of this more or less unavoidable defect during paper manufacture are explained, as well as aggravating conditions, such as too short conditioning periods between manufacture and supercalendering, too tight winding of the rolls, the use of moist wood in packing the reams, and the present necessity of converting "green" paper before it has a chance for sufficient maturing. E.S.

PAPER—DEFECTS

MAKARIUS, THEODORE. Paper distortion. Modern Lithography 19, no. 11: 48, 123 (November, 1951).

The various causes of excessive fanning and paper stretching the long way of the sheet, or across the width of the press, are discussed, and means for detecting this distortion and for correcting it are suggested. M.W.

MEHTA, R. M. Some defects in paper and their remedies. Indian Pulp and Paper 6, no. 1: 63-6 (July, 1951).

Various paper defects which can arise from the paper machine are described, and their causes and possible remedies are given. M.W.

PAPER—OPTICAL PROPERTIES

L. E. The whiteness of paper. Allg. Papier-Rundschau no. 16: 694 (Aug. 26, 1951). [In German]

The whiteness of paper depends primarily upon the fibrous raw materials and their bleaching degree; it can be improved by the addition of fillers,

particularly titanium dioxide. Reference is also made to optical bleaching agents, the addition of dyes, and German instruments for measuring whiteness. Coated papers exhibit the highest degree of whiteness (96-98% reflection); they are superior to all uncoated grades whose maximum reflection will not exceed 90%. E.S.

STENIUS, ÅKE S:SON. The application of the Kubelka-Munk theory to the diffuse reflection of light from paper; a critical study. Parts I and II. Svensk Papperstidn. 54, no. 19: 663-70; no. 20: 701-9 (Oct. 15, 31, 1951). [In English; German and Swedish summaries]

An analysis of the Kubelka-Munk equations was made to investigate their applicability to a determination of residual lignin in pulp from its reflectance in ultraviolet light according to a suggestion by P. W. Lange. In the first part the optical structure of a handmade sheet is analyzed and the probability that its surface layers are less opaque than its central section discussed. It is shown that the reflectance values of a multilayer sheet deviate from those of the ideal layers assumed by Kubelka and Munk in their theory of the diffuse reflectance of light. However, an ideal layer in accordance with this theory may easily be prepared by folding an ordinary handmade sheet once. The difference between measured and calculated values of reflectivity (the former are too high) of a handmade sheet is explained. Methods are given for correcting the deviations by calculating the light-scattering coefficient of a handmade sheet so that it decreases with decreasing basis weight. In the second part the Kubelka-Munk equation for the absorption coefficient k was studied, and its limitations are presented graphically, with particular reference to applications in the pulp and paper industry. The unequal distribution of the light-absorbing properties in a sheet was studied, and the ratio of measured and theoretical values of k analyzed. Confirming Van den Akker's statement (*cf.* B.I.P.C. 20: 255-6), k was found to be less than 1. The influence of gloss in reflectance values was studied, and it is shown that deviations caused by gloss between directional and total reflectance are partially nullified by errors which result from the substitution of relative reflectance measurements for absolute ones. 1 table, 9 figures, and 23 references. E.S.

PAPER AND PULP INDUSTRY

ALLEY, HAROLD R. Japanese handmade paper industry. Paper Ind. 33, no. 8: 932-3 (November, 1951); *cf.* B.I.P.C. 22: 118.

Papermaking by hand in the Ogawa section, about 60 miles northwest of Tokyo, is depicted in a series of 10 photographs. E.S.

AMERICAN PAPER AND PULP ASSOCIATION. Planned new capacity for the paper and board industry. Tappi 34, no. 11: 8A, 10A (November, 1951); *cf.* B.I.P.C. 21: 564.

A tabulation of the annual survey of new capacity for 1951, 1952, and 1953 for the paper and board industry and a summary of new capacity for 1951 and 1952 for wood pulp are presented. The total paper and board capacity at the end of 1953 is estimated at 27,167,745 tons, that of wood pulp at the end of 1952, at 18,599,710 tons. 6 tables. E.S.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. Wood pulp. Unasylva 5, no. 2: 71-4 (April-June, 1951); *cf.* B.I.P.C. 20: 881.

Wood pulp production and trade statistics for 1950 are presented for sev-

eral individual countries, and the price situation on the international market is discussed. Production of wood pulp in Europe in 1950 increased about 10% over 1949 levels, in Canada and the United States together about 15%, and in Latin America about 6%. Production in Japan increased 25%, and there was a slight increase in output in Australia. During 1950 most countries restricted imports from dollar areas and, as a consequence, reduced their purchases from North America. The total exports of Canada, Sweden, Finland, Norway, and the United States exceeded those of 1949 by 680,000 tons. North American exports to Europe, Latin America, Australia, and New Zealand decreased, whereas Northern European exports to Europe, Latin America, and the United States showed an increase. During 1950 spot prices in many instances have been considerably higher than regular contract prices, but high prices did not seem to be a strong deterrent to pulp consumers. 4 tables. M.W.

PAPER AND PULP INDUSTRY—EDUCATION

ANON. Kalamazoo paper school; how it has grown in just three years. Pulp & Paper 25, no. 12: 40, 42 (November, 1951); *cf.* B.I.P.C. 20: 413.

The activities and accomplishments to date of the school at Western Michigan College are reviewed briefly. 6 illustrations. E.S.

ANON. Munich, the educational center for paper and print. Wochbl. Papierfabr. 79, no. 10: 306 (May 31, 1951). [In German]

Reference is made to the educational facilities in Munich for papermaking, graphic arts, and related industries which make the city the training center of the new generation in the postwar period. The facilities include papermaking courses at the Institute of Technology and the Oskar von Miller-Polytechnikum, the Institute for Food Technology and Packaging, the Institute for Graphic Arts (which has recently been granted university status), the German Museum with divisions for paper and print, and forestry courses at the university. In addition, Munich has large libraries and printing establishments. 3 references. E.S.

GUELCHER, C. W., and MCKINNEY, D. D. Developing technical personnel at Hammermill. Mech. Eng. 73, no. 11: 885-6, 891 (November, 1951); Tappi 34, no. 12: 38A, 40A, 42A (December, 1951).

The personnel program at the Hammermill Paper Co. is described. Part of the program consists of a series of training activities which include a three-year pulp and paper course for technical workers, management breakfast meetings, organization and operations training in all parts of the mill, and work simplification conferences. M.W.

JENNESS, L. C. An industrial lecture program for students of chemical engineering. Tappi 34, no. 11: 155-6A (November, 1951).

A report on the effectiveness of a procedure is described which is utilized at the University of Maine for fostering co-operation between industrialists and universities or colleges in the training of young men for positions in industry. The plan takes advantage of the participation of industrialists in the teaching of college students who expect to enter the field of pulp and paper or allied industries. This program has now been in effect for three years, and is considered to be very successful by students, faculty, and representatives of industry (pulp and paper and machinery manufacturers). Details of the implementation of the program are given. E.S.

PAPER AND PULP INDUSTRY—EXHIBITS

ANON. Hand paper-making demonstrated at London exhibition. Paper Ind. 33, no. 8: 921-2 (November, 1951); *cf.* B.I.P.C. 21: 790.

A brief reference is made to the handmade paper demonstration at the recent Festival of Britain exhibit and to the procedures involved. 1 illustration. E.S.

GRÜNE, AUGUSTE. A visit to the "Forschungstelle Papiergeschichte" in Mainz. Wochbl. Papierfabr. 79, no. 10: 313-14 (May 31, 1944). [In German]

Reference is made to the purpose, collections, and some of the exhibits of the German center for paper history which was founded in 1938 and which is housed in the Gutenberg Museum in Mainz. 1 reference. E.S.

PAPER AND PULP MILLS

ANON. Burnley Paper Works instal new unit. World's Paper Trade Rev. 136, no. 12: 838, 840, 842 (Sept. 20, 1951).

A brief description of the new stock-preparation equipment and Yankee-type paper machine is given which started operation at the Burnley Paper Works Co., Lancashire in August, 1951. The beater-house equipment includes four twin-bedplate beaters and a Masson-Scott midget refiner; the 96-inch trim width machine has a Yankee cylinder, 10 feet in diameter, a vapor-extraction hood, and three predrying cylinders, 4.5 feet in diameter. Most of the equipment was manufactured by Joseph Winterburn Ltd. 3 illustrations. E.S.

ANON. Cornwall expands; new Dominion machine—144 in. Pulp & Paper 25, no. 12: 74 (November, 1951).

A brief reference is made to the expansion program of the Cornwall Division of Howard Smith Paper Mills at Cornwall, Ont., including a new Fourdrinier machine, three additional digesters, a Curlator, a new Dorr causticizing system, and auxiliary equipment. 4 illustrations. E.S.

PAPER MILL NEWS. Crown Zellerbach modernization program. Paper Mill News 74, no. 46: 118 (Nov. 17, 1951); *cf.* B.I.P.C. 22: 122-3.

Improvements are described which are under way or have recently been completed at the Crown Zellerbach Corp. mill at West Linn, Ore., and at the converting plants at San Leandro and Los Angeles. A brief description of the new development laboratory at the Central Research Department of the Camas, Wash. mill is also presented. M.W.

PAPER MILL NEWS. $500,000,000 for new mills, new machines, modernization. Paper Mill News 74, no. 46: 48-50 (Nov. 17, 1951); *cf.* B.I.P.C. 22: 32.

A list (in alphabetical order of companies) of new mills or new machines is presented, which have come into operation between November, 1950 and November, 1951 or are under construction or projected. The entire "Modernization issue" of *Paper Mill News* contains numerous descriptions of the different mill programs under way; however, only those of greater length have been abstracted (see under heading: Paper and Pulp Mills). E.S.

PAPER MILL NEWS. Halifax completes modernization. Paper Mill News 74, no. 46: 98, 136 (Nov. 17, 1951); *cf.* B.I.P.C. 22: 123.

Some of the features of the improvement program of the Halifax Paper Company, Inc., Roanoke Rapids, N.C., which has been partially completed, are described. 1 illustration. M.W.

PAPER MILL NEWS. I-P's $75-million modernization program. Paper Mill News 74, no. 46: 54, 56, 60 (Nov. 17, 1951).

The International Paper Company has announced a $75-million expansion and modernization program for 1950-2. This program includes the doubling of the capacity of the new dissolving pulp mill at Natchez, Miss. (*cf.* B.I.P.C. 21: 117), the installation of a new 300-ton per day bleached kraft board and paper unit at Moss Point, Miss., additional bleaching capacity and machine modernization at the Bastrop, La. and Mobile, Ala. mills, and new milk container plants at Kalamazoo, Mich., Atlanta, Ga., and Kansas City. The new Natchez unit will also employ the sulfate process, with the use of hardwoods, to produce dissolving pulp, and will bring total viscose-pulp production at the mill to 600 tons per day. The equipment for the mill is listed. 4 illustrations. M.W.

PAPER MILL NEWS. More modernization for Union Bag. Paper Mill News 74, no. 46: 114 (Nov. 17, 1951); *cf.* B.I.P.C. 21: 862.

The current expansion underway at the Union Bag & Paper Corp., Savannah, Ga., includes the addition of a new paper machine, a 300-ton semi-chemical pulp mill, and a new turbogenerator, woodyard modernization, and expansion of the multiwall-bag converting plant. This program will be completed in 1953 and will increase the tonnage of paper and paperboard from 1350 to 1750 tons daily. 3 illustrations. M.W.

PAPER MILL NEWS. Nekoosa-Edwards expansion program. Paper Mill News 74, no. 46: 70-1, 136 (Nov. 17, 1951); *cf.* B.I.P.C. 21: 102.

The expansion program of Nekoosa-Edwards Paper Co., Port Edwards, Wis., which was started in January, 1951, includes a new paper machine at the Nekoosa mill which will increase production about 30%, modernization of the kraft mill to increase pulp capacity from 150 to 200 tons, a paper storage warehouse at the Port Edwards mill, and an enlargement of power production and distribution facilities. Details of this program with a description of new equipment are given. 4 illustrations. M.W.

PAPER MILL NEWS. $17,000,000 M & O expansion. Paper Mill News 74, no. 46: 87-8 (Nov. 17, 1951); *cf.* B.I.P.C. 22: 124.

The Minnesota and Ontario Paper Company's modernization program is described. 1 illustration. M.W.

PAPER MILL NEWS. $3,500,000 Rhinelander modernization. Paper Mill News 74, no. 46: 120 (Nov. 17, 1951); *cf.* B.I.P.C. 22: 123-4.

The improvement and expansion program currently under way at the Rhinelander Paper Co. is described, and the process used to manufacture yeast from spent sulfite liquor is mentioned. 1 flowsheet. M.W.

PAPER MILL NEWS. $30 million expansion for St. Regis. Paper Mill News 74, no. 46: 91-2 (Nov. 17, 1951); *cf.* B.I.P.C. 21: 253.

The two new kraft mills under construction by the St. Regis Paper Company at Pensacola and Jacksonville, Fla., will add approximately 200,000 tons per year to the company's kraft paper production. The equipment for the new mills is listed. 1 illustration. M.W.

PAPER MILL NEWS. West Virginia's mills modernized. Paper Mill News 74, no. 46: 105-6, 108 (Nov. 17, 1951); *cf.* B.I.P.C. 22: 121-2.

Details are presented of the current modernization and expansion programs of the West Virginia Pulp and Paper Co.'s mills at Covington, Va., Charleston, S.C., Luke, Md., and Mechanicville, N.Y. 3 illustrations. M.W.

ST. REGIS PAPER COMPANY. St. Regis kraft center expansion. Paper Trade J. 133, no. 19: 12, 14, 16 (Nov. 9, 1951); *cf.* B.I.P.C. 21: 253.

The completely integrated wood-to-multiwall-bag mill at North Pensacola, Fla. is now being enlarged. Seven new digesters, a new blowtank, and new stock-preparation equipment which consists of six Shartle Miami jordans and four Claflin refiners will be installed. The new Bagley & Sewall Fourdrinier will trim 210 in. and have a wire 120 feet in length. Other new equipment includes a complete recovery system. 10 illustrations. M.W.

PAPER MACHINE OPERATION

MCDERMOTT, J. A. Problems relative to high speed kraft paper machines. Paper Trade J. 133, no. 21: 21-2 (Nov. 23, 1951); Pulp & Paper 25, no. 9: 76, 79 (August, 1951).

In attaining speeds up to 1600 ft./min. with kraft paper, the problem of removing the water after the paper is on the wire becomes increasingly difficult. A forming board is used to overcome this difficulty. It is adjusted to the underside of the wire and scrapes the water from the wire and supports it at the point where the weight of the water is heaviest. At the couch roll it has been found most practical to use a narrow suction area with a very high vacuum. Instrumentation and automatic control are considered the most important factors in high-speed operation. M.W.

PAPER MANUFACTURE

ANON. The story of paper. Paper & Twine J. 25, no. 9: 10-11, 19-20 (November, 1951).

The history of paper and the processes used for its manufacture are reviewed very briefly. 1 illustration. M.W.

PAPER SPECIALTIES

AB TETRA PAK, *Lund, Sweden.* New Swedish milk "carton" . . . Tetra Pak uses 65% less kraft. Am. Boxmaker 40, no. 11: 20-2 (November, 1951); Pulp Paper Mag. Can. 52, no. 12: 88 (November, 1951); Paper Trade J. 133, no. 18: 12 (Nov. 2, 1951); Packaging Parade 19, no. 226: 115-16 (November, 1951); Paper Ind. 33, no. 8: 911 (November, 1951); Boxboard Containers 69, no. 708: 51, 53 (December, 1951); Am. Paper Converter 25, no. 12: 14-15 (December, 1951); Chem. Eng. News 29, no. 51:

5398 (Dec. 17, 1951); Brit. Packer 13, no. 11: 32-3 (November, 1951); Paper Box Bag Maker: 188-9 (November, 1951); Fibre Containers 36, no. 12: 162, 164, 166, 168 (December, 1951); *cf.* B.I.P.C. 22: 33.

The "Tetra Pak," a bleached kraft paper package in the form of a tetrahedron, and its manufacture are described, and its advantages for the packaging of liquids, particularly milk, are enumerated. 5 illustrations. M.W.

ANON. Cohesive papers. Modern Packaging 25, no. 3: 82-4 (November, 1951).

Cohesive papers, which adhere only to themselves and require the application of pressure to obtain a secure closure, provide a packaging medium especially suitable for food products and multiple-unit packs of small items. The self-sealing material is a specially compounded, odorless, tasteless, and nontoxic rubber derivative which effects a firm, lasting seal with many types of papers. Two packaging applications of cohesive papers which are described are individually wrapped pieces of peanut brittle and sterile adhesive bandages. 3 illustrations. M.W.

ANON. It's easier to sell napkins to restaurants. Paper Sales 11, no. 11: 18 (November, 1951).

Because of the increased rental rates for linen napkins, restaurants can now use paper napkins for approximately half the cost of renting cloth ones. As a result, paper napkins are finding a wider market among restaurant operators. 1 table and 1 illustration. M.W.

DAY, FREDERICK T. Paper conversion and usage. No. 19 (Parts 1 and 2). Heatfix label papers—their application and uses. World's Paper Trade Rev. 136, no. 15: 1016, 1018, 1020; no. 17: 1198, 1200 (Oct. 11, 25, 1951).

In the first part of the article, a description of heat-fix or heat-seal papers is given, including a survey of the various body papers used and their manufacture, as well as a discussion of the two principal varieties available today (those which must remain under pressure while cooling takes place, and delayed-action sealing papers in which the heating and the application of the label involve two separate operations, which permits much higher machine speeds). Consideration is also given to the application of heat necessary to apply these labels to surfaces. In the second part printing processes for such papers are discussed; most grades are suitable for either letterpress or lithography without need for special machinery or other preparation. Printing inks should be used in which the liquid phase or solvent does not activate the adhesive. Advantages of heat-fix papers include the elimination of messy manufacturing operations and regular washing of machinery, greater production speeds, the possible application to surfaces likely to be adversely affected by aqueous solutions, and the elimination of unevenness of application, water streaks, wrinkles, and dirt resulting from the adhesive. 2 illustrations. E.S.

DICKINSON, THOMAS A. Perhaps you can make use of evaporation coating. Am. Paper Converter 25, no. 11: 10-11, 54, 56, 58 (November, 1951).

Evaporation coating is a process whereby metals or other materials are vaporized in a vacuum and deposited on paper or film for functional or decorative purposes. It is probably the only method by which pure metallic materials can be applied to paper without intermediate adhesives or binding mediums; however, its most important use in the converting field may

involve the application of nonmetallic substances. Coatings which are used to render papers fireproof and to increase the surface hardness, moisture resistance, and insulating properties of paper have been applied by this method. The coating units are described, and the production costs which are involved are considered. 2 tables and 5 figures. M.W.

FITZWATER, TOM. Bakeries like things nice. Paper Sales 11, no. 11: 14-15, 48 (November, 1951).

Because appearance and quality in packaging are of major importance to bakeries, they represent a diversified market for paper salesmen. In spite of a great degree of standardization in their packaging requirements, they desire an identifying feature in their packaging items. Since white is the most popular color for bags, doilies, etc., a colored printed trademark can be used to provide store identification. Included with the article is a comprehensive list of paper products and related items which can be sold to bakeries. 1 illustration. M.W.

GUMMED PRODUCTS COMPANY. Two new box tapes claimed radical and revolutionary by manufacturer. Fibre Containers 36, no. 10: 58, 63-4 (October, 1951).

Production of a new type of multiwall tape is announced. The tape consists of plies of kraft paper which are bonded at the edges only. The center parts of the plies are free to flex individually; slight variations in the width of successive plies, increasing from the gummed side to the outer side, permit the free adaptation of each layer to any applied stress. This tape is being marketed under the trade name of Trojan Tro-Ply. A second new tape, Trojan Tro-Flex, consists essentially of a kraft tape in the glue line of which is incorporated a continuous zigzag nylon strand which is arranged in such a pattern that it will continuously crisscross the joints when applied to a box. M.W.

KOTTE, HANS. Specialty papers of the postwar period. Allg. Papier-Rundschau no. 17: 729-30; no. 18: 771-2 (Sept. 12, 26, 1951). [In German]

This is an extensive discussion of the book by R. H. Mosher "Specialty papers, their properties and applications" (*cf.* B.I.P.C. 20: 933). E.S.

L. E. Abrasive papers. Allg. Papier-Rundschau no. 19: 820 (Oct. 12, 1951). [In German]

A brief outline of the manufacture of abrasive papers, the base paper, and the application of the abrasive medium is given. E.S.

MORRIS, CHARLES V. Ingenuity—royal road to bigger paper orders. The readers write—detailed examples of ingenuity at work. Paper & Paper Products 93, no. 2: 6-7; no. 4: 1, 10-11, 13 (Oct. 5, Nov. 5, 1951); *cf.* B.I.P.C. 22: 125.

Additional examples of ingenious paper substitutions for the benefit of printers are given. 4 tables. E.S.

O'LEARY, MARTIN J., SCRIBNER, BOURDON W., and MISSIMER, JOSHUA K. Resin bonding of offset papers containing mineral fillers. Tappi 34, no. 11: 506-11 (November, 1951); *cf.* B.I.P.C. 21: 182.

Papermaking studies at the National Bureau of Standards have shown that melamine-formaldehyde resin, used as a binding agent in offset lithographic papers containing no mineral fillers, has the beneficial effects of improved printing quality, decrease in the beating time of the fibers, and large increase in permissible content of hardwood fibers. The last is desirable for the conservation of the scarcer softwood fibers. The previous work has shown that as little as 1.5 hours of beating give satisfactory results with the usual 50% hardwood fibers increased to 75% when 1 to 3% of melamine resin is added. Further investigation has been made to determine whether these beneficial effects occur when the mineral fillers, clay and titanium dioxide, are used. With 1.5 hours of beating of a fiber furnish consisting of 75% soda pulp (hardwood fibers) and 25% sulfite pulp (softwood fibers), 15% clay made the papers too soft for lithographic papers, lowering all their desirable physical properties. The addition of the melamine resin had little or no beneficial effect on these papers. However, with a 50% sulfite—50% soda—15% clay furnish, the physical properties were improved by the addition of 3% melamine resin, resulting in good lithographic papers. The clay retention was lowered slightly by the addition of 3%, and more so with 1% melamine resin. When the stock was given 5.5 hours of beating, the melamine resin was of assistance in producing improved lithographic papers made from 75% soda pulp and 25% sulfite pulp. When 3% titanium dioxide was added to both 50% soda—50% sulfite, and 75% soda—25% sulfite furnishes with 5.5 hours of beating and 1 and 3% of melamine resin added, satisfactory offset papers were produced. The retention of the titanium dioxide was decreased somewhat by the resin. As reported in an earlier publication, the retention of both fillers was improved by using an excess of aluminum sulfate and adjusting the stock to the desired pH with sodium carbonate. 3 tables, 7 figures, and 9 references. E.S.

PARTICLE SIZE

ROSSI, CORRADO, and BALDACCI, RUFFO. Determination of the particle size of fine powders, with particular reference to kaolins. J. Applied Chem. 1, no. 10: 446-52 (October, 1951).

The sedimentation curves for suspension of kaolins from Central Europe, Italian bentonites, and clays have been obtained by using a hydrostatic balance provided with a normal plunger. Investigations undertaken to establish the accuracy of the method and the theoretical calculation of the sedimentation curves are described briefly. The possibility of applying Stokes' law to the mass settling of kaolins is also discussed. The authors wish to emphasize (*a*) the possibility of determining the average diameter of powder particles by means of the tangent to the curve at zero time, and (*b*) the possibility of deducing from experimental sedimentation curves both the curves relating to size distribution (the number of particles as a function of equivalent diameter) and the cumulative curves (the percentage by weight of particles having dimensions smaller than a given equivalent diameter). When carrying out sedimentation measurements, particularly with kaolins, it is possible to obtain regular curves only when conditions are such as to avoid flocculation. This result is achieved by adding suitable electrolytes in quantities which determine the smallest sedimentation volume. The average equivalent diameters of the powders examined were deduced from such sedimentation curves. Statistical measurements of dimensions made by direct microscopic observations have been carried out on two kaolins from Central Europe, resulting in average values which agree very closely with those calculated from the sedimentation curves. Cumulative curves of the usual type have been obtained from the densitometric curves of sedimentation. 1 table, 7 figures, and 20 references. E.S.

PATENTS

WIHAN. A discussion of inventions and patents. Wochbl. Papierfabr. 79, no. 14: 448-50 (July 31, 1951). [In German]

The author discusses the psychology of the inexperienced inventor and gives useful directions for obtaining a patent in Germany. The former German patent office in Berlin was destroyed during the war, and a new patent office has been established and is operating in Munich. Reference is made to the German statute, according to which annual, increasing fees (starting with D.M. 30.00 in the first year) throughout the 18-year life of the patent have to be paid, so that the total sum paid on expiration amounts to approximately D.M. 5500.00; if the fees are not paid punctually, the patent expires immediately and irrevocably. E.S.

PHYSICAL TESTING—PAPER

GUHA, S. R. D. Physical testing of paper at the Cellulose and Paper Branch, Forest Research Institute, Dehra Dun. Indian Pulp and Paper 6, no. 1: 68-70, 72 (July, 1951).

The author describes tests for dimensional properties, (basis weight, thickness, and bulk) and strength (tear, tensile and stretch, burst, and folding endurance). 5 references. M.W.

KOTTE [HANS] Strength properties of bag papers. Allg. Papier-Rundschau no. 20: 864 (Oct. 26, 1951). [In German]

Reference is made to the statistical study of Andersson (*cf.* B.I.P.C. 22: 138) and the lack of correlation in the properties of handsheets and machine-made paper. An experimental paper machine (working width 22 cm.) is described which was constructed by the Papierfabrik GmbH. vorm. Brüder Kämmerer, Osnabrück and which was exhibited at the recent DRUPA show in Düsseldorf; the machine is recommended for laboratory work to obtain a better correlation between laboratory and mill data. 1 illustration. E.S.

PHYSICAL TESTING—PAPER—FEEL

KILPPER, WILHELM. The handle of paper. Wochbl. Papierfabr. 79, no. 10: 288, 290, 292, 294 (May 31, 1951). [In German]

The author discusses the somewhat nebulous term "handle of paper," by giving first the explanation of previous investigators, according to whom handle involves a combination of hardness, bulk, rattle, stiffness, and closed surface (smoothness); in the author's opinion, flexibility (folding endurance) must also be included. No instrument or measuring procedure exists which will indicate this combination of properties, and the suggestion has been made that the term should be entirely discarded. Twenty-three paper samples of different origin (for which their manufacturers claimed that they possessed a good handle) were systematically tested for their basis weight, bending stiffness, bulk, specific gravity, compressibility, folding endurance, Bekk smoothness, and furnish, and the results are presented in a table; for comparative purposes, these data were also determined for a number of good printing and writing papers, and the results presented in a second table. The average values of the two groups show that all papers with good handle have low specific gravity and good bending stiffness and folding endurance; the smoothness of the first group lies far below that of the second group. Nearly all papers of the first group gave high values for two properties but failed in a third one. The four top papers of this experiment were all writing or bank papers with a basis weight of around 100 g./sq. m.

All papers of the lot were rag or rag-content papers, gave a positive starch reaction, and contained little filler. The data in the first table show that the term handle is often applied in cases where it is not justified; for instance, text papers are voluminous, but do not possess bending strength and, hence, good handle. The author concludes that handle as a characteristic paper property of a certain class of high-grade papers (bank, document, writing, and certain offset papers) is justified and that the term should not be discarded. However, it should not be applied in cases where it is not required or where it does not belong (wrapping paper, text paper, book paper, etc.). 4 tables, 2 diagrams, and 5 references. E.S.

PHYSICAL TESTING—PAPER—FOLDING ENDURANCE

ANON. The construction of the Köhler-Molin double-folding tester for determining the folding resistance of paper and board. Wochbl. Papierfabr. 79, no. 16: 513 (Aug. 31, 1951). [In German]

An improved folding endurance tester is described in which the tension springs are replaced by easily controlled construction elements. Two strips are inserted simultaneously in two pairs of clamps; the upper ones oscillate around an angle of 312° so that each sample can be folded around 156° to each side. The lower clamps are loaded with exchangeable weights, in accordance with the thickness of the sample under investigation. The folding rate is 200 double folds per minute; the instrument is driven by a motor. Greater accuracy is claimed for this tester than for the tension spring-operated Schopper instrument. It is constructed by Firma Karl Frank, Weinheim-Birkenau, Germany. 1 illustration. E.S.

WAHLBERG, THOMAS. The folding endurance test. Part 2. Method of measurement. Svensk Papperstidn. 54, no. 20: 710-16 (Oct. 31, 1951). [In English; German and Swedish summaries] *cf.* B.I.P.C. 22: 193.

The author discusses the method of making folding-endurance tests. The distance which the lower clamp travels during the folding cycle is studied as a function of the folding angle and the time and its influence on the applied tension of the specimen. A two-sidedness with regard to folding has been observed resulting from the asymmetry in the clamp, especially in the case of thick paper. The influence of the curvature of the edges of the jaw has also been studied. It was found that the smaller the radius of the curvature, the lower is the folding endurance. By means of variance analysis it is shown how results from different jaws should be compared to determine whether the instruments give comparable results. Contrary to earlier results (*cf.* Schopper, B.I.P.C. 7: 277-8; The Institute of Paper Chemistry, B.I.P.C. 10: 20), it has been found that the logarithm of the load *vs.* the logarithm of the folding endurance gives a linear relationship. An endurance limit for paper has not been found. No relationship between the breaking load in the Schopper tensile tester and the folding endurance could be established. For the standard testing of folding endurance it is recommended that a fixed load be employed. For routine production tests a load which gives a folding figure of 100 to 300 is considered suitable. By a given formula folding numbers which correspond to other loads can be calculated. The tests were carried out with the Köhler-Molin instrument, of which a brief description is given; the tester is built in Sweden by A/B Lorentzen & Wettres Maskinaffär in Stockholm and in Germany by Karl Frank, Weinheim-Birkenau. Special precautions in testing are outlined. 3 tables, 10 figures, and 7 references. E.S.

PHYSICAL TESTING—PAPER—HARDNESS

LIEBERT, ERHARD. The measurement of the hardness of paper. Wochbl. Papierfabr. 79, no. 10: 294, 296, 298, 300 (May 31, 1951). [In German]

For all writing or printing papers the property of softness or hardness is of significance, in addition to smoothness, which is of prime importance. Density (I), bulk (II), air permeability, porosity, and even handle give a certain indication of hardness, but are not a direct measurement of it. Reference is made to procedures by Bekk (*cf.* B.I.P.C. 8: 212) and Clark (*cf.* B.I.P.C. 16: 151) from which hardness data may be derived. Recently, pendulum hardness testers (hardness swings) have been placed on the market (*cf.* Bekk, B.I.P.C. 18: 251) for measuring the hardness of paper, films, lacquers, etc. An instrument of this type (which is described briefly) was used for a series of experiments to isolate the factors which exert an influence on the hardness of paper. The results indicate that (I) is of major importance, although data on (I) or (II) alone are not sufficient to characterize hardness. With increasing (I) or decreasing (II), hardness increases appreciably. Calendering causes an increase and fillers a slight, but distinct decrease of hardness; the cooking degree or the addition of rosin size and alum within reasonable limits does not affect the results. In uncalendered papers the beating degree is of distinct influence; in calendered papers a maximum hardness is reached at about 40° S.-R. The advantages of a possible hardness characterization of paper to printers and paper converters are mentioned; it is self-evident that softer papers will also exhibit reduced strength properties. Definite smoothness or gloss specifications will place certain limitations on the hardness range. In conclusion, several improvements to the tester used in these experiments are mentioned; it is manufactured by Firma Karl Frank, Weinheim-Birkenau, Germany. 9 figures and 7 footnotes.

E.S.

PHYSICAL TESTING—PAPER—PICK RESISTANCE

ROEHR, WALTER W. A rotary pick tester. Tappi 34, no. 11: 525-8 (November, 1951).

In the printing of both coated and uncoated book papers, the proper pick resistance or surface-bonding strength is necessary if optimum printing quality is to be obtained. Until recently the available test methods have not been entirely satisfactory, particularly for some types of pick and on certain types of paper. The present development was undertaken in an effort to construct an improved testing unit and is based, in part, on bonding strength work done by The Institute of Paper Chemistry (*cf.* B.I.P.C. 17: 192-3). The instrument was designed to simulate to some extent actual printing procedures and to provide sufficient control of the known variables to permit keeping the tester in statistical control. Fundamentally, it consists of a stationary, rubber-covered impression roll (to which one or more test samples are attached) and a movable black Carrarra-glass plate carrying a uniform film of the picking fluid. This arrangement is similar to that of a flat-bed cylinder printing press. The plate is driven by a specially designed cam which produces a variable speed proportional to the distance traversed. For the picking medium, a Newtonian fluid, such as blown castor oil, is preferred. On the theory that the tensile stress applied to the sample surface is proportional to the viscosity of the fluid used and to the speed with which it is pulled away from the surface, a judicious choice of speed range and viscosity permits the determination of a pick number for every sample run. Among the variables which were found to influence test results are relative humidity, temperature, film thickness, and nip pressure. 3 tables, 4 figures, and 1 reference.

E.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

THE INSTITUTE OF PAPER CHEMISTRY. The ink receptivity of newsprint. Progress Report Five. Am. Newspaper Publ. Assoc. Tech. Report no. 2: 20 p. (Nov. 1, 1951); see below.

A study of the nip spreading of ink as a method for determining the ink receptivity of paper has been extended beyond the work presented in Progress Report Two (*cf.* B.I.P.C. 21: 32-3). The influence of roll slippage on spread pattern areas has been found to be small and may be neglected for speeds lower than 200 cm./sec. The influence of asymmetry of impact between the roll and ink drop reflects the accompanying decrease in roll pressure on the ink drop by the production of smaller spread areas. This error may be rendered negligible by careful alignment of the roll on the incline. The influence of drop size on the area of spread patterns obtained with smooth nonabsorptive surfaces has been re-examined. The nonlinear relationship results from decreasing nip pressures with increasing drop size. The percentage of ink retained by smooth nonreceptive surfaces was approximately 51 for all drop sizes. Spreading measurements on a series of gravure and halftone plates provide a basis for separating the relative influences of roughness and absorptivity. The percentage of surface void volume filled with ink increased as the roll speed decreased. The percentage of ink retained on a given plate was independent of roll speed and varied only slightly with "roughness" from plate to plate. These observations, combined with those for paper where it was observed that the percentage of ink retained decreased markedly as roll speed increased, suggest that this variation with paper results exclusively from the absorption of ink into the paper. A method for studying the "instantaneous" absorptivity of newsprints is thus suggested. The results of the application of this tentative method of analysis to two newsprints, a coated book paper, and a blotter are presented. For absorption times as short as 0.01 second, marked differences in the apparent news ink absorption were found. One newsprint absorbed 60% more ink than the other. The use of low-viscosity mineral oils in place of the news ink resulted in larger spread areas and appeared to provide a more decisive method for distinguishing between the average receptivities of newsprints. The mottled appearance of the papers immediately after the spreading of the oils is also of marked interest and may provide a basis for a more quantitative study of "localized" receptivity. 8 tables and 8 figures. E.S.

PHYSICAL TESTING—PAPER—SMOOTHNESS

THE INSTITUTE OF PAPER CHEMISTRY. The Chapman smoothness tester. Progress Report Four. Am. Newspaper Publ. Assoc. Tech. Report no. 1: 32 p. (Oct. 8, 1951); *cf.* B.I.P.C. 21: 258.

This report presents the results of a study of the Chapman smoothness tester. The principles of operation of this device are described, and the modifications incorporated in the Chapman tester constructed at The Institute of Paper Chemistry are discussed. Investigations of purely instrumental variables included observations on the linearity of the photocell-galvanometer systems, the influence of lamp voltage on the instrument constants and printing smoothness, the influence of certain variables of the standardization procedure, and the nature of a "zero-current" correction. The influence of color was shown probably to be essentially the effect of wavelength on the relative area of the specimen in optical contact with the glass prism of the apparatus; in accord with the theory of physical optics, the observed relative area of optical contact increased with the effective wavelength. The effect is probably not of importance in studies of undyed newsprint, but should be remembered in close comparisons of the printed smoothness of dyed news-

prints of strongly different colors. In accord with general experience, the printing smoothness increases markedly with increasing platen pressure. Using large numbers of newsprint specimens, a study of variability was made; in agreement with the findings of Chapman, the combined influences of instrumental and sample variabilities were found to be surprisingly small. The Chapman smoothness of newsprint is also rather independent of the number of sheets of backing paper. Only a small change occurred when the number was increased in numerous steps from one to 20 sheets, and there was no significant variation in the observed smoothness of newsprint over the range in backing sheets from one to eight. A crude, although definite correlation was found to exist between Bausch and Lomb gloss and Chapman smoothness when various papers were used. There is a need for a thin, soft, transparent film to be placed between the test specimen and the glass prism. Such a film results in substantially higher relative areas of optical contact (now between the paper and the film), which is felt to be desirable in arriving at a better simulation of the conditions of actual printing. 13 tables, 10 figures, and 7 references. E.S.

PHYSICAL TESTING—PAPER—VAPOR TRANSMISSION

MULDOON, T. J., and SYLVESTER, F. J. The transmission of organic vapors through packaging materials. Food Technol. 5, no. 11: 449-52 (November, 1951); *cf.* B.I.P.C. 21: 416.

Some results are given from vapor transmission tests with the split-cell technique in which methyl furoate is diffused through a packaging material and, in the presence of potassium hydroxide, reacts with water to form methyl alcohol and furoic acid, the quantity of which is measured spectrophotometrically. The organic vapor transmission rates for various packaging films were determined, and plain sulfite, 450 PT cellophane, and polyethylene showed the lowest percentage of mean deviation, whereas glassine and saran 517.4 had a large scatter in their transmission rates. Glassine, saran, and waxed sulfite showed the lowest transmission rates. It was found that when a wax coating of 5 lb./ream is applied on glassine and sulfite, the vapor transmission rate is reduced to 2.5% of that of the uncoated sheet. It was also observed that the relative humidity at which the tests are run has a great influence on the transmission rate. Some sheets were found to transmit organic vapors 10 times as rapidly at high relative humidities (84%) as at low (34%). 3 tables and 3 figures. M.W.

PHYSICAL TESTING—WAXED PAPER—SEALING STRENGTH

CAPELL, R. G., RIDENOUR, W. P., and TEMPLIN, P. R. Sealing strength of waxed papers. Tappi 34, no. 11: 515-19 (November, 1951).

The importance of the sealing strength of waxed paper, the nature of the thermoplastic heat seal, and the measurement of sealing strength are discussed. Data are presented on the effect of fiber orientation, oil content of the wax coating, printing ink, temperature, time, and paper stiffness on seal strength. The results of a sealing-strength survey of commercial, waxed, bread-wrapping papers are presented. 5 tables, 9 figures, and 10 references. E.S.

PITCH TROUBLES

BACK, ERNST. Solubilization phenomena during the dissolution of resinous material in pulp- and papermaking. Svensk Pappers-

tidn. 54, no. 19: 657-62 (Oct. 15, 1951). [In Swedish; English and German summaries]

A survey is given of colloid-chemical phenomena during the alkaline dissolution of resinous materials, i.e., the solubilization of unsaponifiable, water-insoluble, resinous components by the fatty and resin soaps (I) formed on saponification. In this dissolution process, (I) show properties which are typical for surface-active agents in water solutions, such as micelle formation and inclusion (solubilization) of water-insoluble or slightly soluble organic substances. Following a review of the general structure and solubilization properties of soaps, available data on the micelle-formation and solubilization power of resinous components in wood are tabulated; this information is used as a basis for discussing the dissolution of resinous matter in pulping processes. Several factors of significance in the dissolution process are demonstrated by experiments with a ray-cell pulp containing 16% of resinous matter. 5 tables, 3 figures, and 20 references. E.S.

PLASTIC FILMS—TESTING

FLIERL, D. W. Methods of rating film durability. Modern Packaging 25, no. 3: 129-31, 197-8 (November, 1951).

Tests for three physical properties of films, flex life, impact strength, and tear strength, are described. The Du Pont flex tester, the pendulum-type and the falling-ball impact testers, and an adaptation of the Elmendorf tearing tester are included. Procedures and typical data are given. 4 tables, 4 illustrations, and 3 references. M.W.

PLASTICS

HAGEN, GUSTAV. Surface treatments of paper and board with plastics. Allg. Papier-Rundschau no. 17: 734-9 (Sept. 12, 1951). [In German]

The author reviews recent paper-plastics combinations by laminating or coating, including processes, plastic materials, and applications, particularly those which are of interest in Germany. 5 figures and 9 references. E.S.

PLASTICS—PAPER-BASE

WILSON, C. W. Large laminate cylinders. Modern Plastics 29, no. 3: 106-7 (November, 1951).

The insulating cylinders used in large General Electric power transformers are described. One type is a hard, dense laminate of paper and a phenolic-type resin, and the other, a paper-adhesive type, is made from a heavy water-finish kraft paper and is bonded with dextrin or an organic resin adhesive. The cylinder rolling machine, which is designed to take mandrels as large as 90 in. in diameter, is described. The rolling process is a one-step operation and is termed "dry process." As the paper approaches the mandrel, it passes over a hot plate where finely ground, dry resin is sprinkled onto the web. The heat from the hot plate melts the resin which collects in a pool formed in front of the mandrel and above one of the saddle rolls. The tube is cured in a high-velocity, hot-air oven. 3 figures. M.W.

PLASTICS—TESTING

MALM, CARL J., GENUNG, LEO B., and TOWNSEND, MAURICE L. Plasticizer quality test. Anal. Chem. 23, no. 11: 1692-4 (November, 1951).

A test for objectionable impurities in plasticizers consists in placing 5 ml. of the plasticizer in a test tube, inserting a strip of ashless filter paper so that it is half immersed, and heating at 180°C. for one hour. Any discoloration (ranging from light yellow-brown to black) of the filter paper indicates the presence of impurities. Color standards may be made from paper strips which are soaked in iodine solutions of varying concentrations. A correlation between plasticizer quality and the stability of compositions was found by measuring viscosity breakdown under various conditions of heating; samples which contained impurities showed a considerable viscosity loss. 6 tables. M.W.

POPLARS

POURTET, JEAN. The poplar—its place in the world. Unasylva 5, no. 2: 55-9 (April-June, 1951).

A report of current research on the genus *Populus* is presented which includes sections on history, identification and nomenclature, creation of new types, propagation and cultivation of poplars, enemies of poplar trees, and uses of poplarwood. A suggested program for further research is also outlined. It includes a study of types of poplars which can be grown on comparatively dry soils of average or below-average richness, a study of the ecology and method of cultivation of southern white poplars, research on the utilization of the various types of poplarwood, and research on poplar culture in the hot temperate zone. M.W.

PRINTING AND PRINTER'S INK

ANON. Rigid, transparent plastic used as rub-out sheet. Boxboard Containers 69, no. 707: 28 (November, 1951); Southern Pulp Paper Manuf. 14, no. 11: 29 (November, 1951); Fibre Containers 36, no. 10: 120 (October, 1951).

Vinylite plastic in rigid sheet form is now being used in folding paper-box plants to check register between cutting dies and printing plates. The transparent plastic has exceptional dimensional stability, and because of its resistance to moisture, grease, ink, and most chemicals, it can be re-used several times. 1 illustration. M.W.

PRINTING AND PRINTER'S INK—ANILINE PROCESS

BAKER, HORACE C. Why aniline printing? Am. Pressman 61, no. 12: 58, 60, 62, 64 (November, 1951).

The aniline printing process is described, and its advantages and limitations are considered. 3 illustrations. M.W.

PRODUCTIVITY

SEARLE, ALLAN D., and PUGLISI, ENZO A. Output per man-hour in 27 industries, 1950. Monthly Labor Rev. 73, no. 4: 422-4 (October, 1951).

Statistics on productivity (the relationship between the quantity of goods produced or the amount of service rendered, and the man-hours expended) which were compiled by the Bureau of Labor Statistics are quoted. An increase in 1950 of 11% over 1949 is reported for the pulp and paper industry, where man-hour output trends have a general relationship to changes in the volume of production. 1 table and 3 figures. M.W.

RADIO

R.C.A. VICTOR COMPANY LIMITED. Forestry communications systems. Pulp Paper Mag. Can. 52, no. 11: 146, 148, 150, 153 (October, 1951).

Following a brief consideration of the limitations of telephone and high-frequency radio communications for forestry operations, the advantages of very high-frequency radio systems with frequency modulation are presented. With a careful survey of required operational facilities, a good choice of equipment, proper maintenance, and a flexible system in order to provide the maximum use of equipment, very high-frequency radios provide the best communication system for forestry operations. A typical forestry system is outlined, and an estimate of costs is given. M.W.

RAW MATERIALS

BHAT, R. V. Some new indigenous cellulosic materials for paper and board industry. Indian Pulp and Paper 6, no. 1: 30-2, 34 (July, 1951).

The pulping properties of the following native fibers are summarized: (1) *Ricinus communis* (castor stems), (2) *Boswellia serrata* (Salai), (3) *Lannea grandis* (Jhingan), (4) *Broussonetia papyrifera* (paper mulberry), (5) *Helicteres isora* (Maror phal), (6) *Cryptomeria japonica*, (7) *Sterculia campanulata* (Papita), (8) *Arundo donax* (Narkul), (9) *Phragmites karka* (Nal), and (10) *Vetiveria zizanioides* (Panni grass). The possibility of utilizing these fibers as a much-needed source for suitable pulp for wrapping paper and newsprint is considered. M.W.

RAYON—VISCOSE PROCESS

LAUER, K. The study of cellulose fibers. 19. The study of soda cellulose. Makromol. Chem. 7, no. 1: 5-10 (July, 1951). [In German; English summary] *cf.* B.I.P.C. 22: 45.

A complete thermal analysis of the reactions involved between sodium hydroxide and cotton cellulose and mercerized cotton cellulose, respectively, was carried out by measuring the amount of sodium hydroxide taken up and determining the heat evolved. Sodium hydroxide solutions in concentrations between 21 and 40% by weight were used. The heat evolved in reactions between water or sodium hydroxide and certain positions of the cellulose was also determined. The data indicate that water reacts first with the hydroxyl groups in the 3-position of the crystalline regions, and then in the 3-position of the semicrystalline regions, and that the sodium hydroxide is exchanged with the water of hydration in the 3-position of the amorphous region. 3 tables, 2 figures, and 11 references. M.W.

MARGULIES, PAUL H. Hydrogen peroxide; it cuts viscose aging time. Rayon and Synthetic Textiles 32, no. 11: 36, 66-8 (November, 1951).

The use of hydrogen peroxide to promote the aging of viscose is discussed. If it is added to the mixture of pulp and caustic, neither alkali cellulose formation nor removal of the hemicelluloses is appreciably influenced. Depolymerization, however, will proceed at a much higher rate. Cellulose loss is influenced more by temperature than by the hydrogen peroxide, and alkali solubility and filterability of the viscose are improved with peroxide aging. A description is given of two aging methods which are employed in

European countries and of the preparation of cellulose xanthate from aged alkali cellulose. Two German patents state that the addition of hydrogen peroxide to the xanthate will promote ripening without affecting viscose viscosity. 7 footnotes. M.W.

REEDS

MUCK, OTTO H. Forest and climate protection through modern reed plantations. Allg. Papier-Rundschau no. 19: 810-13 (Oct. 12, 1951). [In German]

The possibilities of the cultivation of resistant hybrids between common reeds (*Phragmites communis*) and *Arundo donax* for solving the raw-materials problem in the colder climates and marshlands of Europe are discussed; mention is made of the possible acceleration of reed growth by gas fertilization with carbonic acid. 1 diagram. E.S.

RESEARCH

MACKENZIE, C. J. Canada and science in 1951. Pulp Paper Mag. Can. 52, no. 11: 86-8 (October, 1951).

The author discusses the international character of science, the present-day dependence of industry and national welfare on science, and the general problem of organizing scientific research facilities so as to serve best the needs of industry. The national developments in Canadian science and the history of the Canadian National Research Council are also outlined. M.W.

RESEARCH LABORATORIES

MILLER, J. HILLIS. The need for a program of research and training for the pulp and paper industry of the South. Paper Trade J. 133, no. 21: 27-9 (Nov. 23, 1951); Southern Pulp Paper Manuf. 14, no. 12: 67-9 (December, 1951); Paper Mill News 74, no. 50: 26, 28-9 (Dec. 15, 1951).

The Pulp and Paper Laboratory of the University of Florida is engaged primarily in the investigation of kraft pulping and problems connected with kraft pulp manufacture. Research on the utilization of scrub oak and the development of the continuous cooking process (*cf.* B.I.P.C. 22: 134) have been carried out there. A continued expansion of the scope and facilities of the laboratory, however, requires the financial support of the paper industry. A program is proposed which includes the development of research problems which are common to the industry, the co-operative support of the research center, and the establishment of scholarships by the companies in the pulp and paper industry. M.W.

SAFETY

ANON. West Virginia Pulp & Paper receives paper industry safety award. Paper Ind. 33, no. 8: 916-21 (November, 1951).

The Williamsburg, Pa. plant of the West Virginia Pulp & Paper Co. received the 1951 E. B. Fritz Memorial Trophy for attaining well over two years of accident-free operation; the development of the safety program is described, and comments by different employees are included. 7 illustrations. E.S.

MURPHY, A. E. Starting an association on a safety program. Fibre Containers 36, no. 11: 104, 106, 108 (November, 1951).

The organization of a safety program by the National Folding Paper Box Association of America is described. M.W.

SEMI-CHEMICAL PULPING PROCESS

BROWN, WILSON F. Further discussion of a new continuous process for kraft pulp. Tappi 34, no. 11: 146-8A; discussion: 148A (November, 1951); *cf.* B.I.P.C. 22: 134.

The description is similar to that given in the previous reference. E.S.

COKER, RICHARD G. Neutral sulphite semichemical pulping. Tappi 34, no. 11: 80A, 82A (November, 1951).

The development and present use of the neutral sulfite semichemical pulping process are reviewed. 3 references. E.S.

SETUP BOXES

ANON. The perennial shoe box. Modern Packaging 25, no. 3: 77-81 (November, 1951).

Setup boxes and rigid folding boxes are used almost exclusively to provide the basic requirements of protection and utility in the packaging of shoes. The shoe box also is a tool for identifying sizes and styles of shoes and for maintaining an accurate inventory of stocks. A relatively recent practice which is being adopted by many shoe manufacturers and stores is the utilization of the box surface for advertising and promotional purposes. The identifying designs used by several firms and retailers are described and illustrated. 12 illustrations. M.W.

FRA. Calculations for cardboard boxes. (X). Allg. Papier-Rundschau no. 16: 691-3 (Aug. 26, 1951). [In German] *cf.* B.I.P.C. 22: 201-2.

A sample calculation is given of the cost (in Germany) of a temporary filing box for desks with hinged lid and cutout in the front for easy removal of the contents. 1 illustration and 2 tables. E.S.

SHIPPING CONTAINERS

FIBREBOARD CONTAINERS. Fibre vs. wood cases. Fibreboard Containers 36, no. 10: 100-1 (October, 1951).

Photographs of a highway accident in which two trucks were involved are reproduced to demonstrate the shock-absorbing qualities of fiber shipping cases. The load of one truck consisted of cargo in baskets, wirebound boxes, or nailed wooden boxes. Examples of each of these can be seen completely demolished from the impact. The other truck contained cargo packed in fiber boxes which remained relatively intact, although in some cases the tape seals were broken. 2 illustrations. M.W.

SLIME PREVENTION

SANBORN, J. R. Relation of red slimes to general paper mill slime control. Tappi 34, no. 11: 490-3 (November, 1951).

The occurrence of various types of slime growth over the past 20 years is shown graphically. The occurrence of red slime has become increasingly important as other types of organisms are brought under control. The effect of the development of slime treatments on the occurrence of types and frequency of various organisms is discussed. Some types of organisms apparently follow a cycle of occurrence. The elimination of slime is only one step in the prevention of undesirable deposits in a mill system. A well-

integrated program is necessary to insure clean systems. 1 table, 2 figures, and 8 references. E.S.

SODA MILLS

PAPER MILL NEWS. Mead soda mill modernization. Paper Mill News 74, no. 46: 80, 82-3 (Nov. 17, 1951); *cf.* B.I.P.C. 21: 494.

The recently completed expansion program of the Mead Corporation, Kingsport, Tenn. is described. 3 illustrations. M.W.

SPECIFICATIONS

INTERNATIONAL HARVESTER CO. International Harvester 'doctors' write 'prescriptions' for Army packages. Packaging Parade 19, no. 226: 58-60, 62 (November, 1951).

A complete set of company packaging specifications is being developed as a guide in meeting the requirements of government specifications. A laboratory for planning production packaging was established. The first step in the work is the study of the blueprints for each item to determine specific methods of packaging. Next the anticipated production capacities are determined, and an actual laboratory packaging of each item is carried out. Finally the proposed specification cards are examined and then released and distributed. 13 illustrations. M.W.

RIPICH, N. L. What's new in military packaging specifications? Am. Paper Converter 25, no. 11: 9, 52, 54 (November, 1951).

With the exception of a growing interest in volatile corrosion inhibitors and the development of unified MIL specifications, the military packaging situation is characterized by a gradual improvement rather than any basic change. The basic methods of packaging have proved their effectiveness in actual use and can be improved only through the development of new materials and means by which improved protection under conditions of long-term storage and intense climatic exposure can be provided. M.W.

SPECIFICATIONS—RULE 41

MATTINGLY, CHARLES D. Rule 41—a million dollar headache. Fibre Containers 36, no. 10: 112, 114 (October, 1951).

The object of Rule 41 is to tell shippers minimum requirements of packaging materials and approximate methods of packaging to reduce shipping damage; the Rule merely describes minimum specifications which were considered safe for the products under consideration at the time they were written. The intent of safe packaging of the Rule, however is lost, except for a very few packaged products, because each of the many million of packaged products presents some variable problems in package engineering, i.e., requires its own tried, tested, and proved package specification. The great majority of shippers feel that, if they follow Rule 41, their packaging is correct and if damage occurs, it is the fault of the carrier. The author believes that Rule 41 should be changed to include mandatory preproving performance tests as recommended by the National Safe Transit Committee; penalty clauses could be added for those packages which do not satisfy these tests. All directions for packaging procedures should be eliminated. To show the fallacies of Rule 41, a case history from the author's company is included where the original poor package of a popular lantern was covered by the general package requirements of the Rule. The first damage complaints were received when a change in shipping conditions from railway express to

parcel post was made; they stopped for a year after certain changes were incorporated in the interior packing which were based on performance tests. When complaints became prevalent again after that period, it was finally traced to a manufacturing error in the glass globes, and once this difficulty had been corrected, no further breakage occurred. E.S.

STANDARDIZATION

KAUL, JAINATH. Standardization, ISI and paper standards. Indian Pulp and Paper 6, no. 1: 53-4, 56-8, 60-1 (July, 1951).

The organization and function of the Indian Standards Institution, a member of the international organization for standardization is described, and the progress made by the committees which are concerned with chemicals and paper is summarized. 1 table and 3 figures. M.W.

STATISTICAL METHODS

MILNE, KEVIN C. A few applications of statistical analysis to control testing. Pulp Paper Mag. Can. 52, no. 11: 103-9 (October, 1951).

Following a brief outline of the theory of statistical analysis, several applications in the pulp and paper industry are outlined (low-consistency testing of sulfite and groundwood stocks, the effect of the addition of starch to board-mill stock on the modulus of rupture of the finished board, and the control of groundwood freeness). 6 tables, 7 figures, and 13 references. E.S.

PATTE, W. E. Statistical techniques in the maintenance of testing instruments. Tappi 34, no. 11: 511-14 (November, 1951).

The problem of instrument maintenance in an integrated mill is outlined, and the number and types of testing instruments maintained in operating order are listed. The location of the testing-instrument maintenance function in the technical organization and its size are described, as well as the punched-edge index cards used for record and maintenance-history purposes. Mention is made of the use of special paper samples for reference purposes to check the agreement of various instruments of the same type throughout the mills; factual data obtained on a weekly check of Mullen testers are used as an illustration, and a discussion on the use of tolerances which identify faulty instruments is included. The number of tests made on each instrument, the tolerances used which include average results from acceptable instruments, and the standard deviation of single values obtained under normal mill-testing conditions are presented in tabular form. 3 tables, 2 figures, and 4 references. E.S.

STEAM POWER

MYERS, DAVID MOFFAT. The paper mill boiler plant. Paper Ind. 33, no. 8: 922 (November, 1951); *cf.* B.I.P.C. 22: 204-5.

The advantages of replacing old inefficient boilers with modern units are discussed. A single new boiler of present-day design with an efficiency of 84 to 85% may usually replace from two to five of the old-type units, with large savings in floor space, cost of attendance, and maintenance which, together with the important fuel savings, comprise a self-liquidating investment. 1 figure. E.S.

STEAM TURBINES

ANDERSON, G. W., and COOPER, A. M. Hints on turbine main-

tenance in paper and pulp mills. Paper Trade J. 133, no. 21: 23-6 (Nov. 23, 1951).

To maintain steam turbines in good condition, a maintenance program should be set up to include systematic, scheduled outages for inspection and repair. A check on changes in temperature, pressure, and vibration can be used to indicate necessary repairs. Regular inspection and cleaning of controls and proper lubrication are also important factors in a maintenance program. 5 illustrations. M.W.

STEROLS

WILLAMO, H. H. The sterols in tall oil and their use. Paper and Timber (Finland) 33, no. 10: 310-14, 316 (October, 1951). [In Finnish; English summary]

The literature on the isolation of phytosterol from tall oil and its possible medical applications is reviewed. The so-called alcohol isolation method is probably the most important procedure for the recovery of sterols. The oxidation of β-sitosterol by chromic acid and its use in the preparation of hormones are discussed. Since Finland possesses important sources of this raw material, the need for further investigations and developments is stressed. 3 tables, 14 figures, and 34 references. E.S.

STRAINS AND STRESSES

BROUGHTON, GEOFFREY, and MATLIN, N. A. The mechanical behavior of paper—Part I. Tappi 34, no. 11: 493-7 (November, 1951).

Much work has been done in the past on the mechanical behavior of paper, including its stress-strain behavior. In most cases, however, the rate of elongation was not constant. In the present investigation, load-elongation curves were measured at constant rates of elongation, varying from 0.02 to 2 inches per minute using the Instron tensile tester. Results are presented for a number of different papers, including handsheets and machine-made papers. The data have been studied, and some tentative correlations are presented. 6 tables, 7 figures, and 7 references. E.S.

STRAW

NASS, HORST. Pulping of straw with cooking liquors containing sodium sulfite. Das Papier 5, no. 21/22: 447-8 (November, 1951); Wochbl. Papierfabr. 79, no. 18: 579 (Sept. 30, 1951). [In German] *cf.* B.I.P.C. 18: 550.

A German strawboard mill experimented with sodium sulfite cooking liquors as suggested in the article by Hannaway; a rotary straw boiler and the following chemicals were used: 2.5% sodium sulfite, 4% lime, and 1.25% sodium hydroxide (referred to the weight of the straw). The best result was obtained with a six-hour cook at 3 atm. The charge was uniformly digested and easy to wash and dye. A board of improved bursting strength and considerably greater stiffness resulted; the surface was smooth and of uniform density. The yield, however, was much lower than that obtained with lime alone, the long cooking period required a reorganization of all other operations, and an improvement in waste disposal and a reduction in boiler-scale formation were not realized, at least not to the extent that was expected. In spite of the undoubtedly better quality of the "sulfite" board, the costs of the process are so much higher than those of the standard methods that it can only be recommended for special cases. E.S.

STREAM POLLUTION

SNOW, WILLIS J. Some industrial waste treatment plants in Connecticut. Sewage Ind. Wastes 23, no. 11: 1408-18 (November, 1951).

Included in this review of some successful waste treatment plants which have been in operation in Connecticut for several years is a section on paperboard-mill white water. Because of the location of the mills, the major problem is solids removal rather than B.O.D. reduction, and sedimentation is the type of waste treatment most frequently employed. 7 figures. M.W.

SULFITE LIQUOR

FRIESE, GÜNTHER. A simple vapor-pressure formula for the system CaO-SO_2-H_2O. Das Papier 5, no. 19/20: 410 (October, 1951). [In German]

A vapor pressure-temperature relationship is given for the system calcium oxide-sulfur dioxide-water, and two semilogarithmic plots which were constructed by the use of August's equation and the empirical data of Gurd, Gishler, and Maass (*cf.* B.I.P.C. 4: 282) are included. 2 graphs and 3 references. E.G.S.

SULFITE PROCESS—MAGNESIUM BASE

HULL, WILLIAM Q., BAKER, R. E., and ROGERS, C. E. Magnesia-base sulfite pulping. Ind. Eng. Chem. 43, no. 11: 2424-35 (November, 1951); *cf.* B.I.P.C. 16: 369-70; 18: 401; 20: 668, 817.

A staff-industry collaborative report is presented in which the manufacture of sulfite pulp is discussed with particular reference to sulfite pulping in which magnesium oxide is used as the base of the cooking liquor. A detailed description of the different departments of the Weyerhaeuser mill at Longview, Wash. is given, which is the first mill to be converted to this process; cooking, dumping and washing, evaporation, burning, acid making, materials of construction, and over-all operation and recovery are considered. Although magnesium oxide pulping has not yet been developed to a state of perfection, it is definitely a solution to the sulfite pulping stream-pollution problem. The increased evaporator capacity which is now being installed at Longview is expected to result in a greater recovery of cooking chemicals and to improve the economics of the process. 5 tables, 3 flowsheets, 9 illustrations, and 22 references. E.S.

SULFITE WASTE LIQUOR

AHLSTRÖM, ARNE. Experiences in the evaporation and combustion of spent sulfite liquor. Das Papier 5, no. 19/20: 401-9 (October, 1951). [In German]

The author presents a progress report on recent Swedish developments and operating experience with the channel-switching system for burning spent sulfite liquor, including the use of higher temperatures which aggravate the incrusting problem. In conclusion, brief reference is made to a special non-cooled combustion chamber for the exclusive combustion of spent liquor where an intensive mixing of air and liquor and complete liquor combustion are obtained. When this chamber is first preheated with an oil burner, continuous combustion without additional fuel can be maintained without difficulty. Three installations of this type operate successfully at present in Sweden. 21 figures. E.S.

BRUNES, BENGT. The recovery, evaporation, and burning of spent sulfite liquor in Sweden. Paper and Timber (Finland) 33, no. 9: 273-9; no. 10: 302, 304-9 (September, October, 1951); Paper Trade J. 133, no. 25: 24-5, 28, 30; no. 26: 18-20, 22, 24, 26 (Dec. 21, 28, 1951). [In Swedish; English summary, and in English]

Swedish developments in the recovery, evaporation, and burning of spent sulfite liquor during recent years are reviewed; diagrams for calculating the net fuel savings through the utilization of the spent liquor are included. 1 table, 9 diagrams, and 22 references. E.S.

CROWN ZELLERBACH CORP. Paper mill company solves waste disposal problem. Chem. Eng. 58, no. 11: 246, 248 (November, 1951).

The Crown-Willamette Division of Crown Zellerbach Corp. is building a 19-acre settling basin adjacent to its West Linn, Ore. plant which will have a capacity of 88 million gallons of spent liquor. The spent sulfite liquor will be held there until the level of the Willamette River is sufficiently high that the waste will not lower the oxygen content to an extent that would be harmful to fish life. M.W.

MURPHY, DIARMUID. A study on the possible production of glycerol from sulphite waste liquor by yeast. Can. J. Technol. 29, no. 11: 471-8 (November, 1951).

Samples of yeast grown on treated spent sulfite liquor in the presence of added sulfites produced ethanol and glycerol in still- and shake-cultures; consumption of sugar was low, and yields of glycerol were small. The addition of sulfites to the medium slowed the fermentation. Attempts to acclimatize the yeast to the medium, or variation in the amounts of added nitrogen or phosphorus compounds, did not improve the rate of fermentation, sugar utilization, or glycerol production. Increasing the sugar content of the medium with sugar-beet molasses yielded no improvement. It was concluded that spent sulfite liquor was not a suitable medium for this fermentation. 5 tables and 16 references. E.S.

SULFUR

ANON. German process may sell here. Chem. Eng. 58, no. 11: 246 (November, 1951).

The Alkacid process of Bamag-Meguin, Berlin, for the removal of hydrogen sulfide from sour gas is being considered by some companies in the United States. It has been widely used in Germany and, through recent improvements, the corrosion problem has been eliminated, and the efficiency of the steam consumption and the absorbing system has been increased. The practicability of the system in the United States may depend on the relative costs of absorbents. 1 flowsheet. M.W.

BIRCHARD, W. H. Sulphur losses in the acid plant. Pulp Paper Mag. Can. 52, no. 11: 99-100 (October, 1951).

The author confines his remarks to the operation of the rotary type of sulfur burner and discusses how sulfur losses in the acid plant may be materially reduced by improving the combustion through the installation of a spray-type burner or the efficiency of the combustion chamber by alterations which will insure a thorough mixing of the gases. E.S.

CRAWLEY, ALBERT, and LEGER, ADRIAN R. Effect of acid to wood ratio on sulphur losses. Pulp Paper Mag. Can. 52, no. 11: 101-2 (October, 1951).

The author discusses the effect of volume of acid to quantity of wood in the digester prior to steaming on sulfur consumption and losses; the advantages of low ratios are outlined. They may be obtained by improved chip packing (13.5 lb. of airdry wood/cu. ft. of digester volume), in which case uniformity of charging and forced-liquor circulation during the cook as well as the correct percentage of combined sulfur dioxide in the cooking acid are essential. Recovery by side relief and during the blowdown period must also be practiced if the full benefits of low acid-to-wood ratios are to be realized. As an example, a mill with extremely low sulfur consumption is mentioned, in which it amounts to 135 lb. of sulfur/ton of total production. E.S.

HINTON, L. G. The recovery of sulphur dioxide at Restigouche Company Limited. Pulp Paper Mag. Can. 52, no. 11: 98-9 (October, 1951); Paper Trade J. 133, no. 20: 18, 20 (Nov. 16, 1951).

Following a brief description of the modified Chemipulp hot-acid recovery system at Restigouche, the possibilities of sulfur dioxide recovery during cooking (I) and from the vomit stack gases (II) are discussed. It should be feasible to improve (I) by either side relief, top relief while digester is at pressure, high-pressure relief during blowdown period to high-pressure accumulator, or low-pressure relief during blowdown period to low-pressure accumulator to such an extent that (II) which involves the installation of large equipment is not necessary. The possibilities, advantages, and disadvantages of the four relief procedures are outlined; the easist way to recover sulfur dioxide is probably by side relief. At Restigouche, the chip packing system was increased and the time of taking the side relief gradually changed from the third to the second hour, so that stronger acid is now reclaimed. Uniformly good circulation is essential in this case. E.S.

TALL OIL

TALL OIL ASSOCIATION. Tall oil in emulsions. Tall Oil in Ind. Bull. no. 9: 4 p. (October, 1951); *cf.* B.I.P.C. 21: 586.

A discussion of emulsions is presented, including a description of the function and action of emulsifiers and means and equipment for making emulsions. Tall oil can be used successfully to make cationic, anionic, or nonionic emulsions. Because of its oil solubility, it is especially suitable as the emulsifier in soluble oils. Other applications of tall oil as an emulsifier are found in the polymerization processes for making synthetic rubber and resins, in agricultural emulsions such as disinfectants and weed killers, in cutting oils, and in asphalt emulsions. 8 references. M.W.

ULTRASONICS

ALGAR, WILLIAM H., and GIERTZ, HANS WILHELM. Fiber structure and pulp properties. II. The influence of ultrasonic treatment on wood cellulose fibers. Svensk Papperstidn. 54, no. 20: 693-700 (Oct. 31, 1951). [In English; Swedish and German summaries] *cf.* B.I.P.C. 21: 768-9.

The effect of ultrasonic treatment on spruce-pulp fibers (holocellulose, semichemical acid sulfite, paper sulfite, dissolving-type sulfite, overcooked sulfite, and sulfate pulps prepared in the laboratory) was invesigated. A Philips ultrasonic generator was employed which operated at 22 kc. The pulps were first disintegrated in distilled water at 0.05% consistency for one minute at half speed in a Turmix mixer with reversed blades and then exposed to ultrasonic treatments for periods of 30 minutes each. The results

of microscopic investigations of the treated pulps are discussed. It was found that the ultrasonically treated fibers swelled more than when exposed to swelling in water; simultaneously, the fibers split longitudinally into fibrils and, ultimately, into the individual units (micellar strings). This holds particularly for the pulps which are rich in hemicellulose. Under certain conditions, ballooning may take place as exhibited in chemical swelling agents (cuprammonium, phosphoric acid, etc.) which indicates the presence of a significant swelling pressure inside the fibers. The primary wall withstands this inner pressure, unless the cook has been so drastic that the wall is weakened by chemical attack and is no longer present as a distinct unit; on ultrasonic treatment, such fibers swell and disperse readily in spite of their low hemicellulose content. Hot-purified pulps swell only insignificantly, and cold-purified pulps not at all. Sulfate pulps, in spite of their high hemicellulose content, did not exhibit any swelling, and this was found in the case of all sulfate pulps under investigation. This may be explained by the presence of internal bonds between structural units or the formation of cross linkages in the hemicellulose itself during the sulfate cook. As expected, the behavior of the different pulps toward ultrasonic treatment parallels the behavior on standard technical beating. However, certain anomalous cases were found, and these will be discussed in a later publication. 1 table, 23 photomicrographs, and 8 references. E.S.

UPKEEP PAINTING

HENDERSON, W. W., and WEILER, CHARLES B. Technical mastics for corrosion control and insulation. Tappi 34, no. 11: 152-5A (November, 1951).

The advantages of different formulations of Erkote technical mastics for corrosion control, particularly in the southern pulp and paper industry, and for insulation are discussed; correct methods of application are outlined. 5 illustrations. E.S.

WASTE

ANON. Good housekeeping thru scrap removal. Fibre Containers 36, no. 11: 60-1 (November, 1951).

A plant-wide system of pneumatic scrap removal in a box plant is described. The system consists of three lines, one of which picks up trim from the corrugator and operates continuously. Two others serve two printer-slotters and the slitter-scorers and operate periodically. The use of this method provides for easy clean-up without the use of scrap trucks and for more working and floor storage space. 4 illustrations. M.W.

WATER AND WATER TREATMENT

PAPER MILL NEWS. Scott water purification program. Paper Mill News 74, no. 46: 94, 96 (Nov. 17, 1951); *cf.* B.I.P.C. 22: 210.

The water purification system of the Scott Paper Co., Chester, Pa., and the Waco filters which are employed in it are described. 3 illustrations. M.W.

WAXES

CLARKE, EDGAR W. Crystal types of pure hydrocarbons in the paraffin wax range. Ind. Eng. Chem. 43, no. 11: 2526-35 (November, 1951).

This study of the crystal types of pure hydrocarbons was undertaken to determine the reasons why a paraffin wax may form three different types of crystals, i.e., needles, plates, and malcrystalline masses. Twenty-three pure hydrocarbons comprising paraffinic, naphthenic, and aromatic compounds in the molecular-weight range of paraffin wax were crystallized from the melt at different rates and from solutions of ethyl acetate and nitrobenzene at different rates and over a wide range of temperatures. Crystals of each pure hydrocarbon (except *n*-hexacosane) were prepared in each of three predominating types: plates, needles, and malcrystalline masses. Needle crystals could be obtained from *n*-hexacosane only by the addition of small amounts of resinous impurities. The two major factors in determining the type formed by each of the pure hydrocarbons were: the rate of crystallization of the solute or the melt, and the temperature difference between the melting point of the pure hydrocarbon and the cloud point (or crystallizing temperature of the solution). The results indicated that waxes which are predominantly naphthenic or predominantly branched-chain paraffins, may be crystallized as needles, plates, or malcrystalline masses by varying the temperature and rate of crystallization. Waxes which are predominantly *n*-paraffins may be crystallized as plates or malcrystalline masses by the variation of the temperature and rate of crystallization, or as needles by the addition of small amounts of petroleum resins. 2 tables, 6 figures, and 16 references. E.S.

WET STRENGTH

GOODALE, ROBERT P. Improved resin developed for wet-strength papers. Paper Trade J. 133, no. 20: 20, 22, 24, 26 (Nov. 16, 1951); *cf.* B.I.P.C. 21: 737.

The properties and characteristics of Uformite 700 wet-strength resin are discussed, and performance data in various furnishes and in toweling are given in tabular form. 4 tables and 6 figures. M.W.

SHIMODA, I., IIZUKA, S., and SAKAMOTO, S. Research on wet-strength paper. J. Japan. Tech. Assoc. Pulp Paper Ind. 5, no. 5: 392-8, 445-6 (October, 1951). [In Japanese; English summary]

The authors have studied the use of melamine-formaldehyde resins in the manufacture of wet-strength paper, and have been able to produce a map paper comparable with that made in the United States. 4 tables, 11 figures, and 2 references. E.G.S.

WOOD—CHEMISTRY

GUSTAFSSON, CHARLEY, SUNDMAN, JACOBUS, PETTERSSON, STIG, and LINDH, THORSTEN. The carbohydrates in some species of wood. Paper and Timber (Finland) 33, no. 10: 300-1 (October, 1951). [In English]

Samples of 20 different hardwood and softwood species and spring- and summerwood samples of spruce and pine were hydrolyzed, and the monosaccharides in the hydrolyzates analyzed quantitatively by means of paper chromatography. The contents of galactan, glucosan, mannan, araban, and xylan in the wood samples were calculated, and the results are presented in two tables. 2 tables and 4 references. E.S.

WOOD—EXTRACTIVES

MIGITA, N., NAKANO, J., and TOROI, T. Antipulping effect of flavanone in larch heartwood in sulfite cooking. J. Japan. Tech. As-

soc. Pulp Paper Ind. 5, no. 5: 399-401, 446 (October, 1951). [In Japanese; English summary]

Sulfite cooks were carried out on the following samples: (1) four types of larch heartwood of varying flavanone content; (2) methanol-extracted larch heartwood; (3) sprucewood; and (4) sprucewood impregnated with flavanone and other compounds structurally similar to flavanone (e.g., pyrocatechol, resorcinol, phloroglucinol, and meconic acid). The tests revealed that flavanone has an antipulping effect in the sulfite cooking of larch heartwood. 2 tables and 9 references. E.G.S.

WOOD—MENSURATION

SEYMOUR, GEORGE. Method of inventorying straw-piled wood. Tappi 34, no. 11: 150-1A (November, 1951); *cf.* B.I.P.C. 18: 128-9.

A method for measuring the amount of wood in a stacked pile in use by the Brunswick Pulp and Paper Co. is described; the base lines are laid out with tapes, and a bubble sextant is used to check the right angles and to determine the height and location of the peak in the pile which eliminates the necessity and hazards of a man working at the top of the pile. The details of the different measurements and calculations are given; the method is less time-consuming and equally as accurate as previous methods in use. E.S.

WOOD—PULP YIELD AND QUALITY

COLLICUTT, S. A. Groundwood flow measurement at Powell River. Pulp Paper Mag. Can. 52, no. 11: 114-15 (October, 1951).

The methods employed at Powell River for measuring groundwood yield from wood, groundwood processing losses, groundwood consistency regulation, and groundwood proportioning to the machines are described briefly. 2 tables. E.S.

SCOTT, J. B. A summary of the methods of measurement of slush stocks and control of losses. Pulp Paper Mag. Can. 52, no. 11: 113-14 (October, 1951).

The methods for measuring pulp production and wood consumption in the sulfite and groundwood mills of the Iroquois Falls Division of the Abitibi Power & Paper Co. are outlined briefly. E.S.

WOOD OPERATIONS

ANON. Mechanization in Southeast. Pulp & Paper 25, no. 12: 84, 86 (November, 1951); *cf.* B.I.P.C. 22: 176.

The mechanization of the logging operations of the Camp Manufacturing Co. at Franklin, Va. are described, with special reference to swamp logging. 8 illustrations. E.S.

WOOD ROOM

PAPER MILL NEWS. Flambeau streamlines woodroom. Paper Mill News 74, no. 46: 86 (Nov. 17, 1951).

Details of a modernization of the woodroom equipment and construction of a hot pond which have been carried out by the Flambeau Paper Division of the Kansas City Star Co. are given. 2 illustrations. M.W.

WOOD TRANSPORTATION

EVANS, JOHN C. W. Field meeting on mechanical hauling and cable yarding. Pulp Paper Mag. Can. 52, no. 11: 134, 136, 138, 141, 143-4 (October, 1951).

The mechanized logging operations of the LongLac Pulp and Paper Co., Ltd. and Marathon Paper Mills of Canada Ltd. and the equipment used are described. 20 illustrations. M.W.

WOOD WASTE

ARMSTRONG, J. J. Wood waste available for pulping. Tappi 34, no. 11: 70A, 72A (November, 1951); *cf.* B.I.P.C. 21: 502.

The author discusses the opportunities of the pulp and paper industry in the South for using the waste products of the lumber industry, particularly top- and slabwood. E.S.

RENTELN, H. VON. Sawdust, a useful raw material for wallboard, board, paper, and similar products. Svensk Papperstidn. 54, no. 19: 671-8 (Oct. 15, 1951). [In Swedish; English and German summaries]

Reference is made to a new process for the utilization of sawdust, shavings, and similar short-fibered wood waste in the manufacture of hardboard, insulating board, molded products, etc., without the addition of binding agents. The method consists of a treatment with a weak alkaline solution (0.1% sodium hydroxide or other alkali) at elevated temperature, which causes a maximum swelling of the wood waste. This swelling is essential for the mechanical defibration in a mill or Jordan and prevents the further shortening of the fibers. Certain details cannot yet be disclosed because of patents which are still pending. Illustrations are included which depict sawdust treated under different chemical and physical conditions. The results of laboratory experiments and mill trials are discussed; strength tests show that the quality of the resulting products is equal to that of mechanical pulp. 1 table and 13 figures. E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ADHESIVES

HERITAGE, CLARK C. Ingredient of adhesives and a process of making it. U. S. patent 2,574,785. Filed April 12, 1947. Issued Nov. 13, 1951. 17 claims. Assigned to Weyerhaeuser Timber Company. [Cl. 106-203; changed to 260-17.2]

A process for the preparation of resinous products for use in adhesive compositions (e.g., for plywood) comprises the steps of reacting finely comminuted vegetable material (e.g., tree bark, nut shells, or the endocarps of drupes) with an aqueous sodium hydroxide solution at about 185°F. for 20 minutes and drying the resulting reaction product. E.G.S.

HERITAGE, CLARK C. Phenolic adhesive and method of bonding wood plies. U. S. patent 2,574,784. Filed Dec. 26, 1944. Issued Nov. 13, 1951. 19 claims. Assigned to Weyerhaeuser Timber Company. [Cl. 154-133]

An adhesive composition which is suitable for use in the manufacture of exterior-grade plywood comprises an admixture of 80-100 parts of a phenol-formaldehyde resin solution which contains about 50% resin solids, and the reaction product which is obtained by the combination of 20 parts of bark powder, 40 parts of water, 5 parts of sodium bicarbonate, and 4 parts of sodium hydroxide. E.G.S.

VAN BECKUM, WILLIAM G., and COOK, HAROLD L. Method of bonding plywood, an adhesive therefor and a process of making it. U. S. patent 2,574,803. Filed March 29, 1947. Issued Nov. 13, 1951. 15 claims. Assigned to Weyerhaeuser Timber Company. [Cl. 154-133]

An adhesive which is designed for use in the bonding of plywood laminates consists essentially of the reaction product of comminuted parenchyma tissue bark powder derived from bark phloem (e.g., from western hemlock or

ponderosa pine) and an aqueous sodium hydroxide solution (20 parts of tissue, 40 parts of water, and 4 parts of sodium hydroxide). E.G.S.

ALKALINE PROCESSES—RECOVERY

SAVELL, WALTER L. Chemical recovery and control in the kraft pulp process. U. S. patent 2,574,193. Filed Dec. 6, 1947. Issued Nov. 6, 1951. 6 claims. Assigned to Remington Rand Inc. [Cl. 252-183]

A method for the regeneration of kraft cooking liquor comprises the steps of concentrating the spent liquor by evaporation; adding salt cake to the concentrated liquor; heating the resulting liquor and destructively distilling and carbonizing it with flue gases to obtain a distillate and a substantially carbonized residue; separating hydrogen sulfide from the distillate; burning the residue to form a melt of inorganic salts and dissolving the salts in water; causticizing the inorganic salt solution; and absorbing in the causticized solution the hydrogen sulfide which has been obtained by the destructive distillation of the cooking liquor. 1 figure. E.G.S.

BARKERS AND BARKING

PIISPANEN, VAINO. Log debarking devices. Canadian patent 477,772. Filed June 14, 1948. Issued Oct. 16, 1951. 3 claims.

The debarking elements of a barker are actuated centrifugally to strike against the log and thus break and remove the bark; the elements are preferably constructed in the form of loops of chains, the ends of which are secured to rotary holders by eyebolts. 2 figures. E.G.S.

SHAW, ERNEST C. Hydraulic log barking machine having support for log-rotating rollers tiltable to laterally discharge the log. U. S. patent 2,575,302. Filed May 16, 1946. Issued Nov. 13, 1951. 7 claims. Assigned to Allis-Chalmers Manufacturing Company. [Cl. 144-208]

A hydraulic barker is provided with a tiltable parallel roll mechanism for handling a log in such a manner as to present its entire surface to the action of a stream of water under the most favorable conditions for complete bark removal; the log is discharged laterally subsequent to the barking operation. 2 figures. E.G.S.

BLEACHING

DAY, GEORGE A., and HOOS, BENJAMIN G. Bleaching of cellulosic materials. Canadian patent 478,118. Filed May 30, 1947. Issued Oct. 30, 1951. 5 claims. Assigned to Brown Company.

A bleaching process is adapted for the bleaching of sulfite and sulfate pulp. As an example, a sulfate pulp is treated, without intervening washing, with hypochlorite and chlorine (the hypochlorite represents 20-50% of the total equivalent chlorine input of the process); the pulp is digested with caustic soda at 140-210°F.; and the digested stock is treated with chlorine dioxide at 140° or above, at a consistency of 4%, and at a pH of 5-7. This is similar to U. S. patent 2,513,788, which covered only the bleaching of sulfate pulp; *cf.* B.I.P.C. 20: 917-18. E.G.S.

BOARD—COATED

PATRICK, JOSEPH C. Polysulfide polymer. U. S. patent 2,553,206.

Filed Oct. 4, 1945. Issued May 15, 1951. 5 claims. Assigned to Thiokol Corporation. [Cl. 260-79.1]

A polysulfide polymeric composition which is tasteless and odorless is suitable for use as a sealing, coating, or lining for food containers. E.G.S.

BOARD, ASBESTOS

BOLLAERT, EDGARD M. Method of making color ornamented asbestos-cement sheets. U. S. patent 2,573,659. Filed July 27, 1946. Issued Oct. 30, 1951. 1 claim. Assigned to United States Gypsum Company. [Cl. 92-39]

A two-tone asbestos-cement shingle comprises several laminations of an asbestos-cement composition which contains added pigments to impart any desired color from white to black, and a surface or top veneer of a color contrasting with that of the base veneer. The top veneer is applied in such a manner as to leave predetermined areas of the base veneer visible. 5 figures. E.G.S.

BOARD DRYING

POWERS, MICHAEL M., and LOECHL, CLARENCE J. Production of gypsum wallboard. U. S. patent 2,573,355. Filed Feb. 18, 1950. Issued Oct. 30, 1951. 2 claims. Assigned to Certain-teed Products Corporation. [Cl. 34-148]

Means are provided for the control of the drying operations in the manufacture of gypsum wallboard in such a way that the board is dried at substantially the same rate throughout its width, and that the drying in the edge portions of the board is retarded and equalized with respect to the drying action in the central portions of the board. 14 figures. E.G.S.

BOARD SPECIALTIES

ACKER, RALPH E. Corner locking construction for paperboard containers. U. S. patent 2,573,379. Filed Nov. 29, 1947. Issued Oct. 30, 1951. 3 claims. Assigned to Container Corporation of America. [Cl. 229-32]

A corner-locking construction for a tray-type paperboard container is designed to lock automatically the walls of the carton in the desired trihedral relation when in the setup position. 8 figures. E.G.S.

CROSBY, WILLIAM H. Collapsible disposable container. U. S. patent 2,574,246. Filed June 19, 1950. Issued Nov. 6, 1951. 5 claims. [Cl. 229-22]

A disposable paraffined container is designed for use in lieu of a bedpan. 5 figures. E.G.S.

GOLDWATER, MELVIN. Insulated container for bottles. U. S. patent 2,573,259. Filed Aug. 28, 1948. Issued Oct. 30, 1951. 1 claim. [Cl. 229-14]

An insulated container for a nursing bottle comprises concentric inner and outer tubular sections which are constructed of cardboard, fiberboard, or asbestos board. The inner container is positioned within the outer jacket in such a manner that an insulating dead air space is formed between the two members. 3 figures. E.G.S.

HEMMING, CHARLES B. Process and apparatus for producing laminated paper tubes. U. S. patent 2,574,329. Filed Sept. 22, 1945. Issued Nov. 6, 1951. 12 claims. Assigned to United States Plywood Corporation. [Cl. 93-81]

A process and apparatus are adapted for the production and curing of thin-walled, phenolic resin-impregnated, convoluted paper tubing. The paper is impregnated with resin, and the impregnated sheet is wound upon a hollow metal mandrel which is heated electrically while the paper is retained tightly on the mandrel, with the result that the tube is cured very quickly. 5 figures. E.G.S.

KURHAN, MAURICE. Novelty basket. U. S. patent 2,572,631. Filed Sept. 11, 1947. Issued Oct. 23, 1951. 3 claims. [Cl. 229-8]

A decorative cardboard basket which is adapted for use as a dispensing container for nuts, candy, and the like is constructed of three separable interlocking parts. 4 figures. E.G.S.

MARR, ANDREW R. Tray-cartons. Canadian patent 477,959. Filed March 7, 1949. Issued Oct. 23, 1951. 1 claim.

A tray-type carton comprises side and end panels which are creased at their bases and are designed to be folded to form the walls of the tray. Tongues extend from the end panels and are adapted to be folded downwardly over corner-forming extensions of the side wall in order to retain the extensions in position. Slots are provided in the end base creases to lock the tongues in a downwardly folded position. 3 figures. E.G.S.

ROOS, JACOB F., and TRAMER, JAN. Containers. Canadian patent 478,234. Filed Dec. 28, 1949. Issued Nov. 6, 1951. 3 claims.

A decorative container for face powder, pills, capsules, chocolates, or the like embodies an outer plastic layer which is laminated adhesively to an inner reinforcing layer of cardboard. 4 figures. E.G.S.

SLAWSON, WILLIAM H. Bathtub protective covering. U. S. patent 2,575,236. Filed July 8, 1949. Issued Nov. 13, 1951. 5 claims. Assigned to Frank M. Wilson and Paul H. Thomas. [Cl. 4-173]

A rectangular, box-shaped corrugated board covering for a bathtub or the like is designed to protect the tub while workmen are finishing the walls adjacent to the tub. 5 figures. E.G.S.

WILLIAMSON, MARSHALL I. Multi-compartment folding cartons. Canadian patent 478,025. Filed April 18, 1951. Issued Oct. 23, 1951. 7 claims. Assigned to National Folding Box Company, Inc.

A multicompartment paperboard bottle carrier embodies individual cells or pockets which are formed by webs extending between the side walls of the carrier. The web structure serves to provide circular or polygonal cells which are adapted to grip snugly a bottle or can. This is the same as U. S. patent 2,558,715; *cf.* B.I.P.C. 21:889-90. 13 figures. E.G.S.

COLORIMETRY

HUNTER, RICHARD S. Color and color difference meter. U. S. patent 2,574,264. Filed March 4, 1949. Issued Nov. 6, 1951. 22 claims. Assigned to Henry A. Gardner Laboratory, Inc. [Cl. 88-14]

A photoelectric tristimulus colorimeter for the direct measurement of three numerical values for the identification of a color on a perceptively uniform color-difference basis incorporates at least one measuring circuit which includes several photocells for the reception of light from the color specimen through filters of different spectral transmission. 7 figures. E.G.S.

DIGESTERS

BOIJA, JOHN. Methods for preparing ligno-cellulosic fibrous material and apparatus suitable therefor. Canadian patent 478,237. Filed Nov. 6, 1948. Issued Nov. 6, 1951. 2 claims.

An apparatus for the heat treatment of wood chips which are to be processed for the manufacture of fiberboard consists of one or more digesters arranged in series and a grinder and screw conveyor located between the last digester and the grinder or between two of the digesters. A feeder is tightly connected to the upper end of the first digester and is constructed so as to feed the chips into the digester at a higher pressure than that corresponding to the temperature of the digester. 2 figures. E.G.S.

ERNST, ALFRED F. Defibering apparatus. U. S. patent 2,573,321. Filed Jan. 19, 1946. Issued Oct. 30, 1951. 1 claim. Assigned to Certain-teed Products Corporation. [Cl. 92-7]

An apparatus for the defibering of wood chips in the presence of atmospheric or superatmospheric steam includes means for controlling the withdrawal of steam and fibers from the pressure chamber; the means comprise a venturi tube which is situated in the outlet conduit and which is adapted to allow the escape of steam and fibers and at the same time to permit the maintenance of an operative steam pressure within the pressure chamber. 2 figures. E.G.S.

ERNST, ALFRED F. Defibering apparatus. U. S. patent 2,573,322. Filed Jan. 19, 1946. Issued Oct. 30, 1951. 1 claim. Assigned to Certain-teed Products Corporation. [Cl. 92-7]

This is similar to U. S. patent 2,573,321 (see above), except that this patent covers the use of an orifice plate instead of a venturi tube. 3 figures. E.G.S.

DISPENSING CONTAINERS

HOUGH, CASS S., WESLEY, ROBERT O., SCALINGI, CIRO R., and GAEKE, LEE B. Container and dispenser for strip material. U. S. patent 2,574,565. Filed March 5, 1949. Issued Nov. 13, 1951. 3 claims. Assigned to Daisy Manufacturing Company. [Cl. 206-56]

A container and dispenser for air rifle shot embodies a continuous strip of interconnected, flat tube-type packages of shot. 7 figures. E.G.S.

INGLES, BARBARA M. Dispensing paper containers. Canadian patent 477,762. Filed May 25, 1950. Issued Oct. 16, 1951. 3 claims.

A dispensing container for milk, cream, and the like, as well as solid materials in powder or flake form (e.g., powdered soap), is provided with a pouring spout. 7 figures. E.G.S.

MASTIN, IRENE. Container. U. S. patent 2,574,927. Filed Dec. 12, 1947. Issued Nov. 13, 1951. 1 claim. [Cl. 229-52]

A paperboard dispensing container for cube sugar incorporates integral handle members which can be folded away from the plane of the carton wall and interlocked with one another. 4 figures. E.G.S.

FOLDING BOXES

BERGSTEIN, FRANK D. Box with overlapped end walls. U. S. patent 2,572,239. Filed Dec. 20, 1947. Issued Oct. 23, 1951. 5 claims. [Cl. 229-34]

A glued paperboard box embodies a locking means for the infolded end-wall flaps, which can not be disengaged by normal outward pressure on the side walls of the box. 12 figures. E.G.S.

BOLDING, HUBERT V. Collapsible cellular carton. U. S. patent 2,574,461. Filed June 24, 1948. Issued Nov. 13, 1951. 4 claims. Assigned to The Bradley & Gilbert Company. [Cl. 229-28]

A one-piece partitioned carton is adapted for the packaging of bottles, light bulbs, eggs, candy novelties, fruits, vegetables, and the like. 11 figures. E.G.S.

EDTMILLER, ANTHONY G. Self-erecting carton. U. S. patent 2,572,123. Filed Sept. 20, 1947. Issued Oct. 23, 1951. 4 claims. Assigned to Cornell Paperboard Products Co. [Cl. 229-41]

A self-erecting carton which is adapted for manufacture on an outfolding machine is provided with a false bottom which is hingedly connected with a front panel along a scoreline. 3 figures. E.G.S.

KELLS, BENJAMIN F., and D'ESPOSITO, JULIAN C. Tuck end container. U. S. patent 2,572,159. Filed April 11, 1947. Issued Oct. 23, 1951. 4 claims. Assigned to Container Corporation of America. [Cl. 229-45]

A tuck-end paperboard container is formed with double end walls to provide a pocket at each end into which a tuck flap on the cover can be inserted. The flaps and end wall elements co-operate to provide a strong stacking construction and to hold the cover locked on the container body. 12 figures. E.G.S.

MICHETTI, LOUIS C. Foldable boxes. Canadian patent 478,224. Filed July 7, 1948. Issued Oct. 30, 1951. 1 claim. Assigned to Noble André, doing business as André Paper Box Company.

A foldable box of the snap-open type requires only one point of presecurement of the parts of the blank which form the box. This is the same as U. S. patent 2,554,677; *cf.* B.I.P.C. 21: 816-7. 6 figures. E.G.S.

INSULATION AND INSULATING MATERIALS

STAFFORD, WILLIAM L. Heat insulating blanket and method of manufacture. U. S. patent 2,554,963. Filed July 3, 1948. Issued May 29, 1951. 6 claims. Assigned to Johns-Manville Corporation. [Cl. 154-28]

A lightweight, flexible, thermal-insulating blanket which is adapted for service at temperatures of up to 2000°F. is produced by an air-suspension dry felting and low-pressure consolidation procedure which develops a thorough interfelting of the asbestos fibers, supplemented by the uniform spray dispersal of a dilute aqueous suspension of bentonite clay binder within the blanket in an amount approximating 1-3% of the total dry weight of the blanket. 2 figures. E.G.S.

MACHINERY—CONVERTING MACHINERY

BOUSQUET, JOHN. Carton creasing and closing machine. U. S. patent 2,573,393. Filed Jan. 12, 1946. Issued Oct. 30, 1951. 2 claims. Assigned to Beech-Nut Packing Company. [Cl. 93-36]

A box-closing machine is adapted for folding in the end flaps of packages of candy-coated gum. 11 figures. E.G.S.

CARKHUFF, LE ROY F. Carton setup machine. U. S. patent 2,572,800. Filed Nov. 23, 1946. Issued Oct. 23, 1951. 5 claims. Assigned to Shellmar Products Corporation. [Cl. 93-37]

A machine for the setting up of egg cartons includes carton-feeding means and a variably positionable carton-registering apparatus. As cartons of variable thickness are fed forward, the cartons are gaged, and sufficient clearance is afforded for the passage of the sections of differing thickness of the advancing carton. 22 figures. E.G.S.

FERGUSON, JOHN L. Automatic carton feeder. U. S. patent 2,573,324. Filed March 29, 1946. Issued Oct. 30, 1951. 4 claims. Assigned to J. L. Ferguson Company. [Cl. 93-53]

A carton-feeding apparatus includes means for squaring out flattened carton blanks and positioning the squared-out blanks, with both ends open, on a holding block. The holding block is advanced beneath a mechanism for sealing the flaps on one end, and the open carton is then filled as desired. 12 figures. E.G.S.

NASMITH, JOHN I. Apparatus for the surface coating of web materials. U. S. patent 2,574,584. Filed May 18, 1948. Issued Nov. 13, 1951. 5 claims. Assigned to Vickers-Armstrongs Limited. [Cl. 91-50]

A roll-coating machine for adhesive surface coating incorporates a slow-running, driven feed roller which dips into the coating material in a reservoir, and a light, balanced, relatively small-diameter stripping roller which is mounted in antifriction bearings that are adjustable in relation to those of the feed roller; this arrangement permits the adjustment of the thickness of the film transferred to the stripping roller. 4 figures. E.G.S.

NOE, HAROLD C. Machine for winding a sheath around a core. U. S. patent 2,574,154. Filed Oct. 25, 1948. Issued Nov. 6, 1951. 11 claims. Assigned to Joseph Dixon Crucible Company. [Cl. 93-81]

A pencil sheath-forming machine is so constructed that after the pencil has been formed and ejected, the machine can be operated continuously without a reversal of the sheath-forming mechanism. The apparatus is adapted for the application of a paper sheath to a core of graphite, rubber, or the like. 14 figures. E.G.S.

SILBY, MARTIN V. Attachment for box-covering machines. U. S. patent 2,574,126. Filed Dec. 5, 1947. Issued Nov. 6, 1951. 7 claims. [Cl. 93-54.2]

A box-covering machine is provided with an attachment by means of which a box shell which is shaped externally like a truncated pyramid and internally like a parallelopiped can be covered. 9 figures. E.G.S.

SILBY, MARTIN V. Attachment for box-covering machines. U. S. patent 2,574,127. Filed Dec. 5, 1947. Issued Nov. 6, 1951. 4 claims. [Cl. 93-54.2]

A box-covering machine incorporates an attachment by means of which a box shell shaped like an octagonal prism can be covered. 13 figures. E.G.S.

MACHINERY—CORRUGATING MACHINE

GEORGE, WALTER C. Apparatus for and process of forming single-faced corrugated board. U. S. patent 2,572,716. Filed June 27, 1949. Issued Oct. 23, 1951. 8 claims. Assigned to Gaylord Container Corporation. [Cl. 154-31]

A method and apparatus are provided for the production of single-faced corrugated board; the height and cross-sectional dimensions of each corrugation are uniform, and a uniform coating of adhesive is applied throughout the length of each corrugation so as to secure permanently the facing strip to the corrugated board. It is claimed that the resultant corrugated board is of uniform strength throughout its area. 5 figures. E.G.S.

MACHINERY—JORDANS

STUCK, HAROLD D. Removable grinding linings for jordan engines. Canadian patent 478,113. Filed Nov. 23, 1949. Issued Oct. 30, 1951. 20 claims. Assigned to John W. Bolton & Sons, Inc.

A jordan plug and shell are provided with removable grinding or abrasive members instead of the conventional knives, bars, and separators. The members can be slipped end to end into pockets formed on a stainless steel backing along the inner surface of the shell or on the conical surface of the plug. The sticks of abrasive material are held in place by means of a low-melting point alloy (e.g., Cerromatrix) which is poured between the sticks and the side fences of each pocket. 12 figures. E.G.S.

MACHINERY—SCREENS

LINDBLAD, KARL R. Methods of screening fibrous suspensions. Canadian patent 478,378. Filed Oct. 19, 1948. Issued Nov. 6, 1951. 10 claims. Assigned to Svenska Cellulosa Aktiebolaget.

A method for the screening of pulp suspensions is described in which the vibratory forces generated by the rotation of a driven shaft are transmitted to a screening drum in such a manner that the drum is set in rotation in the same direction as the shaft and in the direction of flow of the suspension in a trough. 2 figures. E.G.S.

MATHEWSON, WILFRED F. Pulp screen. U. S. patent 2,574,977. Filed Dec. 10, 1948. Issued Nov. 13, 1951. 3 claims. Assigned to Mathewson Machine Works, Inc. [Cl. 92-35]

Inlet and discharge grooves are formed in the inner rotating screen member of a pulp screen; the grooves are endless and extend completely around the circumference of the inner member. 9 figures. E.G.S.

MACHINERY—SHEET-FEEDING MECHANISM

ANDERSON, HELMER. Method and apparatus for feeding blanks.

U. S. patent 2,573,944. Filed Jan. 23, 1948. Issued Nov. 6, 1951. 16 claims. Assigned to General Mills, Inc. [Cl. 271-35]

A device is designed for the feeding of slotted carton blanks one at a time from the bottom of a stack in a direction perpendicular to the slots in the blanks. Means are included for the maintenance of a relative displacement between the portions of the blank being fed at the rear edge of each slot of the blank and the corresponding portions of the adjacent blank at the forward edge of each such slot. 9 figures. E.G.S.

MACHINERY—SHEET STACKERS

BRADFORD, WILLIAM J., and WAHL, OTTO. Sheet stacking device. U. S. patent 2,572,980. Filed March 10, 1948. Issued Oct. 30, 1951. 9 claims. Assigned to W. J. Bradford Paper Co. [Cl. 271-68]

A sheet-stacking device includes means for releasably supporting an accumulating stack of paper sheets and for releasing the stack in co-ordinated relation to a continuously operating machine with which the device may be associated. 7 figures. E.G.S.

MACHINERY—SUCTION BOXES

JENNINGS, IRVING C. Suction boxes for traveling screen filters. Canadian patent 477,894. Filed Oct. 27, 1949. Issued Oct. 16, 1951. 10 claims. Assigned to Nash Engineering Company.

A suction box for a Fourdrinier machine is equipped with small-diameter rollers and is provided with means for supporting the rollers at frequent intervals to prevent their deflection. This is the same as U. S. patent 2,536,446; *cf.* B.I.P.C. 21: 439. 12 figures. E.G.S.

MACHINERY—SULFUR BURNERS

JOBIN, JOSEPH C. Sulphur dioxide gas plants for sulphite pulp manufacture. Canadian patent 477,763. Filed Dec. 2, 1948. Issued Oct. 16, 1951. 7 claims.

A loose, water-sealed connection is provided between the iron pipes of a sulfur burner and the lead pipes of a cooling plant. The connection comprises a partially submerged bell-shaped Duriron fitting which is an extension of a cast iron downpipe and a Duriron nipple which extends out of a water bath and into the submerged end of the fitting. 2 figures. E.G.S.

MOLDED PULP ARTICLES

SHEPARD, ERNEST L. Article pack. U. S. patent 2,575,192. Filed Feb. 9, 1948. Issued Nov. 13, 1951. 2 claims. Assigned to The Canal National Bank of Portland and William B. Nulty. [Cl. 229-2.5]

A hinged, molded-pulp carton is adapted for the packaging and display of two incandescent bulbs, radio tubes, lamp chimneys, or the like. 4 figures. E.G.S.

PACKAGING

CHIPKEVICH, EDWARD A. Tissue package. U. S. patent 2,573,309. Filed Feb. 26, 1947. Issued Oct. 30, 1951. 1 claim. [Cl. 206-57]

A pocket-size package for absorbent tissues comprises a stitched, heat-sealed, or cemented water-resistant envelope which is formed of certain types of paper, cellophane, oilcloth, Pliofilm, oiled silk, or the like. 4 figures. E.G.S.

RODGERS, WILLIAM C. Cleansing tissue package and method of packaging. U. S. patent 2,574,710. Filed Jan. 9, 1948. Issued Nov. 13, 1951. 1 claim. [Cl. 206-46]

A sheet of cleansing tissue is carried in a small tubular sheath which is approximately the size of a cigarette, and is adapted to be removed by the mere parting of the sheath. 6 figures. E.G.S.

SALFISBERG, LEROY L. Labeled package. U. S. patent 2,572,056. Filed Sept. 14, 1946. Issued Oct. 23, 1951. 1 claim. Assigned to Ivers-Lee Company. [Cl. 206-46]

An individual package for a powder, paste, pills, or the like incorporates a paper label, backing, or facing sheet which is attached to a metal foil or Pliofilm package by an adhesive or thermoplastic coating on a portion of one of the layers of packaging material. 11 figures. E.G.S.

THOMPSON, DONALD C. Rayon cake package. U. S. patent 2,573,816. Filed Dec. 5, 1945. Issued Nov. 6, 1951. 6 claims. Assigned to American Viscose Corporation. [Cl. 206-59]

A thin, gas- and liquid-permeable paper wrapper (e.g., tea bag paper) is lapped around an expansible mandrel, an annular package or cake of rayon is placed over the sheet, and the mandrel is expanded. A second sheet which is lapped upon itself so that its diameter corresponds approximately to the outside diameter of the annular package is placed around the package, and the two wrappers are joined adhesively. 5 figures. E.G.S.

PAPER—COATED

NEWBERG, RAYMOND G., SLOTTERBECK, OBER C., and VANDERBILT, BYRON M. Vinyl resin plasticized with liquid copolymer of diolefin and nitrile. U. S. patent 2,552,904. Filed June 11, 1946. Issued May 15, 1951. 5 claims. Assigned to Standard Oil Development Company. [Cl. 260-32.4]

A protective coating or impregnating agent for packaging materials (e.g., paper, cloth, wood, and the like) is prepared by the incorporation of an oily butadiene-acrylonitrile (2.84: 1) copolymer in a polyvinyl chloride resin in the ratio of 40% copolymer to 60% resin. The composition is claimed to possess high tensile strength and good flexibility at normal and low temperatures. E.G.S.

SPOKES, RAY E. Bonding element for friction element assemblies. U. S. patent 2,554,128. Filed Sept. 5, 1947. Issued May 22, 1951. 1 claim. Assigned to American Brake Shoe Company. [Cl. 117-155]

A bonding composition is adapted for use in coating a sheet of paper or similar bonding material to a supporting member, such as a brake shoe or the like. As an example, the bonding substance contains 35.5 parts of a thermosetting phenolic-aldehyde type resin (one-step phenol-formaldehyde resin), 13.0 parts of short-fiber asbestos, 7.0 parts of pulverized cryolite as

a pigment, and 19.0 parts of ethyl or denatured alcohol (all parts by weight). 6 figures. E.G.S.

PAPER SIZING

HORSEY, ELEANOR F., and PRICE, DONNA. Sizing of pulp with rosin and carboxymethylcellulose. U. S. patent 2,572,932. Filed May 11, 1946. Issued Oct. 30, 1951. 1 claim. Assigned to Hercules Powder Company. [Cl. 92-21]

As an example, a paste size composition is prepared by thoroughly mixing 75 parts of sodium carboxymethylcellulose (I) which has a degree of substitution of about 0.68 with 925 parts of a commercial soda-cooked rosin size which contains about 70% by weight of total solids and 20% by weight of free rosin. The sizing composition is a thick paste which contains about 5.2% by weight of (I) on a dry basis. The substance is diluted with water to a concentration of about 3% solids and is used in the beater sizing of a bleached sulfite pulp. Paper samples prepared from this pulp have a news ink sizing test value of about 233 seconds, as compared with a value of 138 seconds for a blank sample which contains no (I). 2 figures. E.G.S.

HOWELL, EDGAR A. Method and apparatus for diluting rosin size. U. S. patent 2,573,024. Filed Jan. 31, 1951. Issued Oct. 30, 1951. 3 claims. Assigned to American Cyanamid Company. [Cl. 137-165] *cf.* B.I.P.C. 21 : 413.

A method and apparatus are described whereby concentrated liquid rosin sizes are heated and diluted continuously and automatically with hot water to a desired gel-free intermediate concentration and are finally homogenized to produce a uniform dispersion, after which they are further diluted with cold water and again homogenized to form a finished dilute rosin size which has a concentration suitable for use in a paper mill. 3 figures. E.G.S.

SWANSON, JOHN W. Dextrinization of manno-galactans. U. S. patent 2,553,485. Filed Oct. 25, 1946. Issued May 15, 1951. 4 claims. Assigned to The Institute of Paper Chemistry. [Cl. 260-209]

An adhesive composition which is adapted for use as a paper size is produced by heating a comminuted mannogalactan substance (e.g., tara, guar, or flame-tree seeds, or locust beans) in a dry condition at 125-140°C. for about 0.5 hour. The heating process is effected in the presence of 0.1-0.5% of anhydrous hydrochloric acid. E.G.S.

PAPER SPECIALTIES

AMBERG, WALTER E. Containers and closure members. Canadian patent 477,888. Filed June 6, 1947. Issued Oct. 16, 1951. 4 claims. Assigned to Lily-Tulip Cup Corporation.

A frustoconical paper container for foods, beverages, and the like is provided with a flanged closure member which is retained in position by a resilient bead on the rim of the receptacle. 13 figures. E.G.S.

ANDRÉ, PER A. S. Automatic closure for valve-bag valves. U. S. patent 2,572,686. Filed May 24, 1946. Issued Oct. 23, 1951. 10 claims. [Cl. 229-62.5]

A device for the automatic closure of sleeved valve bags comprises a pair

of arcuate leaf springs which are mounted at the discharge opening of a paper or fabric filling sleeve; the springs are arranged in such a manner that they tend to fold the end of the sleeve downwardly and inwardly, thus sealing the sleeve. 9 figures. E.G.S.

ATKINSON, WILLIAM B. Electrical apparatus having silicone rubber insulation. U. S. patent 2,557,928. Filed Dec. 15, 1945. Issued June 26, 1951. 9 claims. Assigned to Westinghouse Electric Corporation. [Cl. 174-18]

A gasket material which is suitable for use in contact with halogenated cyclic organic compounds (e.g., chlorinated diphenyl or trichlorobenzene) and paraffinic petroleum fractions is composed of several layers of fibrous material (e.g., asbestos paper, paper, glass fiber cloth, cotton duck, or the like) which are impregnated with and united by an elastomeric organic silicon oxide polymer. The gaskets are adapted for use in conjunction with casings for liquid dielectrics. 5 figures. E.G.S.

BORDEN, GEORGE C., JR. Antifungus wrapper and method of producing same. U. S. patent 2,574,526. Filed Aug. 16, 1949. Issued Nov. 13, 1951. 8 claims. Assigned to Riegel Paper Corporation. [Cl. 117-86; changed to 167-22]

An antifungus paper bread wrapper is provided with an inner coating of dimethyl dichlorosuccinate and ethylcellulose and an outer coating of wax which encloses the inner layer. E.G.S.

BOULWARE, JAMES E. Adhesive laminated paper and box stay tape. U. S. patent 2,575,257. Filed July 26, 1948. Issued Nov. 13, 1951. 4 claims. Assigned to American Reenforced Paper Company. [Cl. 154-53.5]

The marginal edges of a fiber-reinforced, adhesive-laminated wrapping or building paper are substantially devoid of free adhesive and are secured together by adhesive (e.g., asphalt) which has become bonded to the paper (e.g., kraft) by absorption therein. The edges of the paper are also secured to the reinforcing fibers by adhesive which has been absorbed by the paper and by the fibers. When the laminated material is used as a box stay tape for securing the corners of corrugated boxes, one of the paper layers is creped to enhance the stretchability of the tape. 7 figures. E.G.S.

BRADY, CHARLES V., and OTTINGER, AUGUST F. Labelled open-mesh bags. Canadian patent 477,800. Filed Aug. 29, 1949. Issued Oct. 16, 1951. 6 claims. Assigned to Bemis Bro. Bag Company.

An open-mesh bag is provided with a water-resistant paper label; the mesh fabric is woven from a water-resistant twisted kraft paper strip. 7 figures. E.G.S.

BRANDES, GUENTHER C. F. Method of making baskets. U. S. patent 2,574,371. Filed Dec. 28, 1946. Issued Nov. 6, 1951. 8 claims. [Cl. 93-39.1]

In the manufacture of a frameless paper wicker basket, the body of the basket is formed on a mandrel, stiffening end hoops are added, the parts are assembled by stitching or stapling, a paper border is used in assembling the basket into final structural form, and the basket is dipped into a sizing bath in order to contract the wicker around the stiff end hoops. 6 figures. E.G.S.

CROSS, BERT S. Bead coated tympan sheet. U. S. patent 2,555,319. Filed Aug. 17, 1944. Issued June 5, 1951. 15 claims. Assigned to Minnesota Mining & Manufacturing Company. [Cl. 101-420]

A tympan sheet or printing blanket which is adapted for the prevention of offset comprises a paper backing about 0.004-0.016 inch thick, a uniform coating of spherical glass beads about 0.001-0.005 inch in diameter, and a coating of glue which is of less average thickness than the diameter of the beads and which bonds the beads to the backing. 8 figures. E.G.S.

ELLENBURG, ARTHUR M. Compositions of matter comprising halogenated organic compounds. U. S. patent 2,573,894. Filed Aug. 10, 1949. Issued Nov. 6, 1951. 16 claims. Assigned to Monsanto Chemical Company. [Cl. 252-65; changed to 252-63.5]

An impregnant for capacitor paper and other electrical insulating papers comprises chlorinated diphenyl and about 0.05-0.1% of an organic tin compound (e.g., di-, tri-, or tetra-α-thienyl tin) as a scavenger for the diphenyl. 5 figures. E.G.S.

EUSTIS, WARNER. Pressure-sensitive adhesive tape. U. S. patent 2,572,458. Filed May 18, 1944. Issued Oct. 23, 1951. 5 claims. Assigned to The Kendall Company. [Cl. 117-122]

A pressure-sensitive adhesive tape which has favorable electrical properties (e.g., high breakdown voltage and low power factor) comprises a flexible sheet backing (e.g., paper, cellophane, or cloth) which is coated with a normally tacky, pressure-sensitive, elastoviscous composition which has a viscosity of 10^4 to 10^6 poises. The adhesive component of the composition consists of a mixture of polybutene of relatively high molecular weight which has a viscosity of above 10^7 poises and a polybutene of relatively low molecular weight which has a viscosity of about 10 to 10^3 poises. E.G.S.

HOLIK, MELVILLE J. Smudge resistant transfer sheet and process of making same. U. S. patent 2,554,909. Filed April 15, 1946. Issued May 29, 1951. 14 claims. Assigned to Ditto, Incorporated. [Cl. 282-28]

A process for the preparation of a smudge-resistant transfer sheet (e.g., a hectograph or spirit process dye composition carbon paper) comprises the contacting of the surface of a basic aniline dye-containing transfer layer of a transfer sheet with a polyamine (containing at least two NH_2 groups) which is adapted to react with the dye to convert it to a water-insoluble base, and hydroquinone; the treatment is continued for a period of time sufficient to give a layer of water-insoluble colorless base which constitutes not more than 2% of the thickness of the total transfer layer. 1 figure. E.G.S.

HOWELL, HUGH A. Magnetic impulse record member. U. S. patent 2,525,601. Filed April 16, 1947. Issued Oct. 10, 1950. 3 claims. Assigned to The Indiana Steel Products Company. [Cl. 117-28]

A magnetic recording tape comprises a paper carrier which is coated with a ferromagnetic track of particles (e.g., Fe_3O_4) which is well dispersed in an oxyferrite matrix (i.e., a solid solution of oxygen and iron at oxygen contents of up to 0.2% at temperatures below 900°C.). E.G.S.

LAMELA, RAMIRO, and LAMELA, JOSE. Manufacture of envelopes. Canadian patent 477,738. Filed July 14, 1948. Issued Oct. 16, 1951. 5 claims.

The manufacture of paper envelopes is simplified by the elimination of one of the four laps used in the construction of conventional envelopes and the substitution of a gummed zone for the fourth lap. 4 figures. E.G.S.

MCCART, SAMUEL W. Phonograph record envelope. U. S. patent 2,574,050. Filed April 5, 1948. Issued Nov. 6, 1951. 1 claim. [Cl. 206-62]

A heavy paper record envelope is constructed in such a manner that a number of the envelopes may be supported in face-to-face contact within an album or cabinet, whether or not they are filled with records, and at all times be retained in a vertical position. 5 figures. E.G.S.

MANLEY, CHARLES. Wound dressing. U. S. patent 2,572,641. Filed March 10, 1947. Issued Oct. 23, 1951. 4 claims. [Cl. 128-156]

A wound dressing comprises a strip of paraffin-impregnated paper, several layers of gauze or other absorbent material, and an adhesive tape backing. The paraffin has a melting point which is below blood or body temperature. 5 figures. E.G.S.

NORDEN, JESSE. One-piece paper container. U. S. patent 2,572,655. Filed April 19, 1950. Issued Oct. 23, 1951. 4 claims. [Cl. 229-16]

Means are provided for the reinforcement of the vertical edges and base corners of a one-piece paper container which is formed by the folding of a rectangular sheet and the winding of the corners of the sheet around a square base in the middle of the sheet. The carton is constructed with multiply vertical beveled edges and a tab for reinforcing the bases of the edges. This represents a modification of U. S. patent 2,468,306; *cf.* B.I.P.C. 19: 746-7. 6 figures. E.G.S.

RUSSO, JOSEPH A. Envelope. U. S. patent 2,573,610. Filed Oct. 14, 1949. Issued Oct. 30, 1951. 5 claims. [Cl. 229-85]

A mailing envelope incorporates a tearstring by means of which the envelope can be opened without mutilation of the contents. 11 figures. E.G.S.

STRAUSS, MICHAEL J. Bag valve. U. S. patent 2,573,230. Filed June 11, 1948. Issued Oct. 30, 1951. 4 claims. [Cl. 229-62.5]

A valve for a gusseted paper valve bag is designed to remain tight after a filling nozzle has been withdrawn from the loaded bag. 4 figures. E.G.S.

WORTHEN, STEPHEN V. Planographic printing plates and methods of making same. Canadian patent 475,217. Filed Aug. 27, 1947. Issued July 10, 1951. 14 claims. Assigned to S. D. Warren Company.

A process for the production of a planographic printing plate comprises the application to the surface of a coating which consists essentially of a hydrophilic adhesive and a finely divided filler on a paper base, of an aqueous ammoniacal solution of a bivalent metal salt-ammonia complex (e.g.,

cuprammonium chloride). This corresponds to U. S. patent 2,534,650; *cf.* B.I.P.C. 21: 371. E.G.S.

PLASTICS—PAPER-BASE

GONDA, DESIRÉ. Hollow plastic product and method of making the same. U. S. patent 2,572,924. Filed July 7, 1948. Issued Oct. 30, 1951. 5 claims. Assigned to Holoplast Limited. [Cl. 154-117; changed to 154-118]

A continuous tube is formed by the helical winding of a number of narrow ribbons of resin-impregnated paper around a mandrel, preferably of circular cross section. The tube is cut into lengths and shaped to conform with the desired quadrilateral cross section for incorporation in a structural unit which comprises panel-like sections that are interconnected by spaced webs. 8 figures. E.G.S.

SETUP BOXES

GEORGE, WALTER C. Carton with automatic cover locking means. U. S. patent 2,574,384. Filed Nov. 1, 1948. Issued Nov. 6, 1951. 8 claims. Assigned to Gaylord Container Corporation. [Cl. 229-45]

Releasable means are provided for the automatic locking of the cover of a slip- or hinged-cover carton in different closed positions. The molded-plastic, co-operating locking members are secured to the cover and to the body of the box. 8 figures. E.G.S.

SHIPPING CONTAINERS

FREEBORN, JAMES D. Carton openers. Canadian patent 477,947. Filed Jan. 26, 1950. Issued Oct. 23, 1951. 1 claim.

A re-usable carton for bottled beverages is opened by drawing a tear-string through the glued surfaces of the flap of the carton. 4 figures. E.G.S.

GILBERT, JACK A. Carton and carton blank. U. S. patent 2,572,610. Filed June 24, 1949. Issued Oct. 23, 1951. 4 claims. [Cl. 229-31]

A shipping carton for fruits, vegetables, meats, fowl, fish, and the like is formed with trapezoidal side and end walls, such that the filled containers are adequately ventilated when stacked upon one another. 5 figures. E.G.S.

GRANT, JESSE R. Shipping case. U. S. patent 2,573,706. Filed June 21, 1946. Issued Nov. 6, 1951. [Cl. 229-23]

A two-compartment fiberboard shipping case for eggs, fruit, or the like incorporates a cover which is locked onto the case at both ends and in the middle. 9 figures. E.G.S.

RAYBURN, ALDEN G. Container. U. S. patent 2,572,387. Filed May 21, 1946. Issued Oct. 23, 1951. 1 claim. [Cl. 229-16]

A lightweight, double-walled shipping container for perishable foods is provided with a compartment which is designed to receive a solid refrigerant (e.g., dry ice). 7 figures. E.G.S.

SULFITE LIQUOR—MAGNESIUM BASE

HAZELQUIST, SVARRE E. Method of preparing magnesium bi-

sulfite cooking liquor. U. S. patent 2,572,929. Filed March 30, 1950. Issued Oct. 30, 1951. 2 claims. Assigned to Weyerhaeuser Timber Company. [Cl. 23-130]

In the production of magnesium bisulfite liquor by the absorption of sulfur dioxide from waste liquor furnace gases (which contain about 1% of sulfur dioxide) in a slurry of magnesium oxide and water, the pH of the resulting liquor is controlled within a range of 4.0 to 4.5 by the introduction of regulated amounts of sulfur dioxide from an extraneous source to the furnace gases prior to the absorption step, and thus the formation of insoluble magnesium sulfite is prevented. 1 figure. E.G.S.

SULFITE WASTE LIQUOR

ANDERSEN, CARL C. Treatment of waste sulphite liquors. Canadian patent 478,026. Filed Aug. 21, 1939. Issued Oct. 23, 1951. 9 claims. Assigned to Norsk Hydro-Elektrisk Kvaelstofaktieselskab.

A process for the treatment of spent sulfite liquor comprises the passage of the liquor through a bed of acid cation exchanger to remove the bases therefrom and the subsequent regeneration of the exchanger by treatment with an aqueous sulfur dioxide solution to form an acid bisulfite solution which can be used as a cooking liquor. E.G.S.

FARBER, EDUARD. Treatment of wood waste. U. S. patent 2,574,027. Filed Dec. 23, 1948. Issued Nov. 6, 1951. 12 claims. Assigned to Timber Engineering Company. [Cl. 71-24]

A process for the manufacture of a soil conditioner comprises the steps of mixing comminuted wood (e.g., maple, oak, or walnut wood sawdust) with acidified (e.g., with phosphoric or hydrochloric acid) spent sulfite liquor, and drying and heating the mixture at atmospheric pressure at 150-270°C. for a sufficient period to convert a substantial portion of the cellulose into a ligninlike substance. E.G.S.

MARKS, HENRY C. Algaecidal composition comprising a water-soluble cupric salt and lignin sulfonate. U. S. patent 2,551,446. Filed Nov. 19, 1947. Issued May 1, 1951. 10 claims. Assigned to Wallace & Tiernan Products, Inc. [Cl. 167-16]

An algaecidal composition which is suitable for use in water treatment comprises copper sulfate and sodium or calcium lignosulfonate and is substantially free of carbohydrates. E.G.S.

SALVIN, VICTOR S., and HART, WILLIAM J. Spray-dried dyestuff powders comprising lignin sulfonate. U. S. patent 2,574,597. Filed March 3, 1949. Issued Nov. 13, 1951. 5 claims. Assigned to Celanese Corporation of America. [Cl. 8-79; changed to 8-39]

A process for the production of a disperse dyestuff powder comprises the steps of milling a paste which consists of 13.3 parts of 1-hydroxy-4-aminoanthraquinone, 13.3 parts of lignosulfonate, and 13.3 parts of potassium pyrophosphate in about 60 parts of water (all by weight); reducing the aqueous milled slurry to finely divided droplets; drying the droplets to a moisture content of 2-5% by weight by bringing the latter into contact with heated air at about 300°F.; and separating discrete dried particles which are about 25-100 microns in diameter. 1 figure. E.G.S.

TALL OIL

BERGSTRÖM, HILDING O. V., HEIJMER, GUSTAF B., and TROBECK, KARL G. Processes of indurating boards of fibrous materials. Canadian patent 478,225. Filed Dec. 4, 1944. Issued Nov. 6, 1951. 2 claims.

Boards are impregnated with a tall oil distillate, subjected to a heat treatment to dry and harden the distillate, and consequently hardened. This is the same as U. S. patent 2,437,931; *cf.* B.I.P.C. 18: 647-8. E.G.S.

CHRISTENSON, ROGER M., and HARPT, RALPH E. Separation of tall oil components. U. S. patent 2,573,890. Filed Sept. 4, 1948. Issued Nov. 6, 1951. 13 claims. Assigned to Pittsburgh Plate Glass Company. [Cl. 260-97.6]

In a process for the separation of the fatty acids from the rosin acids and unsaponifiables in tall oil, a mixture is prepared which consists of 42% tall oil in the form of a product obtained by the esterification of the fatty acids therein with methanol in the presence of sulfuric acid and a catalyst, and the neutralization of the rosin acids and sulfuric acid, 35% methanol, 18% water, and the remainder of alkali and sulfuric acid combined as salts and alkali combined as rosin acid soaps; and the resultant solution is extracted countercurrently with paraffinic naphtha at 80-135°F. 1 figure. E.G.S.

HASSELSTROM, TORSTEN, and STOLL, MICHAEL. Production of refined tall oil. U. S. patent 2,575,013. Filed Aug. 1, 1947. Issued Nov. 13, 1951. 4 claims. Assigned to National Distillers Products Corporation. [Cl. 260-97.7]

A method for the production of a refined tall oil comprises the steps of admixing sulfuric acid with an intimate mixture of an aqueous tall oil soap, containing sterols and color bodies, and a hydrocarbon solvent (e.g., Troluoil or methyl isobutyl ketone) until the pH of the aqueous phase is below 7; permitting the mixture to stand for a period sufficient for the formation of an aqueous lower layer which contains color bodies and a supernatant layer which contains tall oil dissolved in the solvent; discarding the lower layer; and recovering the tall oil from the solvent layer. E.G.S.

OLSON, HAROLD M. Preparation of metal-organic compounds. U. S. patent 2,573,049. Filed Aug. 31, 1950. Issued Oct. 30, 1951. 7 claims. Assigned to The Harshaw Chemical Company. [Cl. 260-97.5]

A process is adapted for the manufacture of organic salts by the direct reaction of a carboxylic acid and a metal in the metallic state. As an example, 20 grams of 100-mesh manganese powder, 2.5 grams of acetic acid, 2.5 grams of water, and 200 grams of mineral spirits are added to 200 grams of tall oil. The mixture is refluxed for four hours at 135-140°C. The resulting manganese tall oil soap solution, after the water has been distilled off, contains 59.1% solids at 105°C. and 4.82% manganese, and has an acid value of —11.8. 2 figures. E.G.S.

POTTS, RALPH H., and OLSON, ROY N. Apparatus for distillation of fatty acids, tall oil, and the like. U. S. patent 2,573,727. Filed Dec. 15, 1947. Issued Nov. 6, 1951. 2 claims. Assigned to Armour and Company. [Cl. 202-154]

An apparatus for the distillation of fatty acids, tall oil, and the like is provided in which large quantities of steam may be utilized in a distillation operation. The unit includes means for supplying the steam from steam injector pumps, whereby the entrainment produced in the apparatus is carried to preceding or succeeding distillation operations and thereby recovered. 1 figure. E.G.S.

WAXES

LIEBER, EUGENE, and CASHMAN, EDWARD P. Condensation products of silicon halides with chlorwax-naphthalene and chlorwax-phenol. U. S. patent 2,560,355. Filed March 8, 1946. Issued July 10, 1951. 15 claims. Assigned to Standard Oil Development Company. [Cl. 260-448.2]

A pour-point depressor for waxy mineral lubricating oils is prepared by the condensation of chlorinated paraffin wax and naphthalene in the presence of an aluminum chloride catalyst at 70-150°F. (final reaction temperature of about 125° for 1-10 hours); the addition of a silicon halide (e.g., $SiCl_4$, Si_2Cl_6, $SiBr_4$, or Si_2Br_6) without the removal of catalyst or solvent; the hydrolysis and removal of residual catalyst; and the fire and steam distillation of the final condensation product. The composition is suitable for use as a paper coating. E.G.S.

WET STRENGTH

SUEN, TZENG-JIUEQ, and DANIEL, JOHN H., JR. Process for producing cationic urea-formaldehyde resins and products obtained thereby. U. S. patent 2,554,475. Filed March 5, 1947. Issued May 22, 1951. 9 claims. Assigned to American Cyanamid Company. [Cl. 260-69]

A cationic polyfunctional amine-modified urea-formaldehyde resin is adapted for use as a beater additive in the manufacture of high wet-strength paper. E.G.S.

Book Reviews

DE BRUYNE, N. A., and HOUWINK, R., ed. Adhesion and adhesives. New York, etc., Elsevier Publ. Co., Co., 1951. 517 p.

In a discussion, several years ago, De Bruyne (Aero Research Limited, Duxford, England) and Houwink (Rubber-Stichting, Delft, Netherlands) conceived the idea that a comprehensive book on the scientific and technological aspects of adhesion be prepared by a group of specialists. "Adhesion and adhesives," the culmination of this idea, was written by 14 specialists in the Netherlands, England, and the United States, including De Bruyne and Houwink, who also edited the symposium. The book, published by Elsevier, is physically large and extensive, as may be seen from some of the book's "vital statistics": its length is 517 pages, it contains 205 figures, and its several chapters terminate in a total of more than 950 literature references. The book is divided into two parts: Part One on theoretical aspects comprises four chapters on "General conditions for wetting and for adhesion," "Molecular forces," "Rheology of adhesives," and "Static problems"; and Part Two on technological aspects comprises five chapters on "Organic adhesives" (animal glues, vegetable adhesives, synthetic resin adhesives, asphaltic bitumen), "Inorganic adhesives and cements" (sodium silicate and its applications, and inorganic cements), "Rubbery adhesives," "Adhesion in soldered joints," and "The physical testing of adhesion and adhesives." In the opinion of this reviewer, this book is not homogeneous with regard to technical level. The opening chapters, on theoretical aspects, contain fundamental material which should be of considerable value to technical men in industry; indeed, the fundamental material alone should justify the purchase of the book. The technical reader who is engaged in research of an advanced nature in industry will probably be disappointed with the discontinuity which exists between Parts One and Two of the symposium, for the chapters on technological applications are not of generalized or specific value. As an illustration, a technical man engaged in research involving the use of animal glue in a paper mill will find, on turning to Chapter 5A (Animal glues and their industrial applications), not quite four pages on the use of such glue in paper manufacture. Nor is there much scientific information on glue to help him; he may be amazed to find only six literature references at the end of Chapter 5A. As another illustration, let it be supposed that the engineers in a pulp mill wish to improve the litharge-glycerin cement employed in their digesters. In Chapter 6B (Inorganic cements), they will find only 16 lines devoted to this important material. Yet, in Chapter 6B, as in the other chapters on technological matters, there are many pages devoted to many adhesives and their applications. The point is that each topic receives (from the point of view of men engaged in industrial research) scant attention. The indicated remedy, namely, a very considerable expansion of Part Two to volumes of material, may not be feasible; in addition to the considerable cost of this remedy, the expanded material would obviously relate to contemporary practices, and would constantly be in need of revision. In any case, an effort should be made to improve and expand the fundamental material in the earlier pages of each technological chapter. The shortcoming of Part Two, discussed above, is partly the result of an obviously good feature of the book. Most readers interested in adhesives will be glad to have so full a collection of working characteristics of adhesives conveniently at hand, gathered together in one reference book. This, with the previously indicated value of the fundamental chapters, should make the book a good acquisition for any technical library.

J. A. VAN DEN AKKER

The PULP and paper industry in the USA; a report by a mission of European experts. Paris, publ. by the Organisation for European

Economic Co-operation, 1951. 378 p. [Official distribution agent in the United States: Columbia University Press, New York]

This publication has been prepared in two general sections. The first represents the over-all full general survey of the American pulp and paper industry as developed through the collaboration of all the members of the mission. The second presents the details of the technical surveys by each of the six established groups, including specialized machinery, pulp manufacture, paper manufacture, paper and board processing, trade associations, and wages and conditions of employment. In any such arrangement there is bound to be repetition, but this is to be expected. This volume should be read in the light of the purpose behind its presentation, namely, to assemble the experiences of the various European experts where they could be made readily available in the interpretation of the pulp and paper industry to those interested in the industry and living outside of North America. It seems to the reviewer that it has achieved this particular purpose. In addition, however, there are a number of items of interest to American readers. The volume presents a large amount of information regarding production, costs, grades, finances, and the like, all together in a relatively few pages. The figures as used have been taken largely from A.P.P.A. publications; here they are assembled somewhat in their relation to each other. Details and drawings of many relatively recent pulp and paper and converting processes have been assembled and evaluated in terms of conventional European practice. The very considerable reliance of the American industry on the activities of the technical man has been cited as an important reason for the advance position of the industry in this country. The freedom of the industry in the United States to develop within a wide area and among a large population is contrasted to the restrictions placed upon the European industry by trade, customs, and national barriers. The philosophy of the American industrialist, operating under the American political system, is stressed time and again as are both the desirability and the difficulty of applying the same philosophy in Europe. A short concise statement of the American philosophies will be found in Chapter II of the first section. The recommendations of the commission as summarized on page 85 are worthy of reading, for in a way they set apart the various items which the mission members felt might be profitably adopted in European practice. Space in this review will not permit the listing of these recommendations, but they do indicate the desirability of accepting the American idea of standardization and specialization in terms of equipment, reduction in number of grades, development of standard lines, production of products of quality sufficient for a particular purpose rather than much higher quality than the use required, acceptance of standard paper sizes and substances by Europe as a whole, increased instrumentation, increased use of paper and paperboard for packaging problems, increase in their research and development work, the need for more aggressive salesmanship and wider use of market research, the development of the use of trade associations, and a changed attitude toward labor-saving devices. This book is not to be looked upon as a learned scientific treatise. There are probably errors in the description of technical processes; these will be particularly evident to readers who are experts in specific fields. Nevertheless these are minor matters. It is very evident to the reviewer that the 125 industrial and research groups who have co-operated with the ECA in making available to the members of this mission the operational details of the American pulp and paper industry have opened wide their doors and welcomed without question the members of the mission. The report contains much information not to be found in technical journals or reference work, at times inserted as though it were almost commonplace knowledge. The American industry seemingly has given freely of its experience and knowledge in an attempt to help European industry pull itself up and out.

H. F. LEWIS

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